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# Southern Medical Journal

## Journal of The Southern Medical Association

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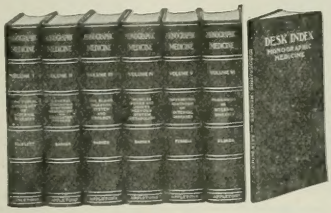


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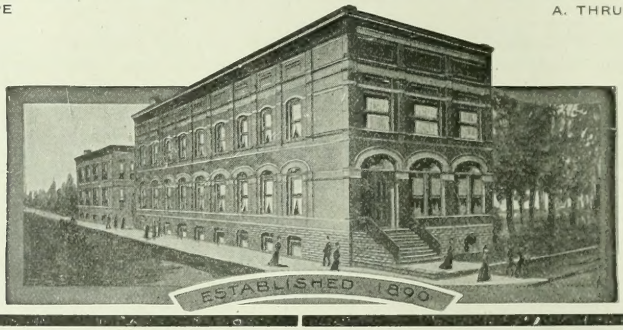


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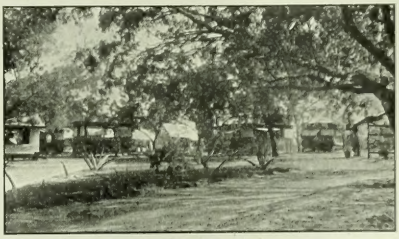

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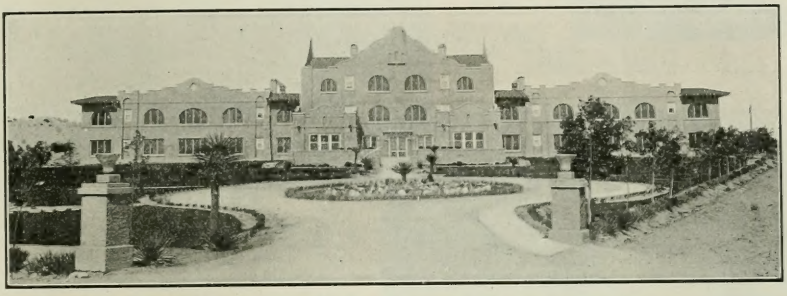

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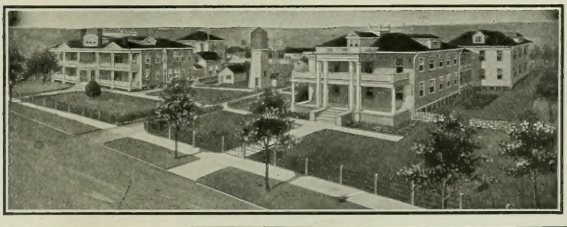

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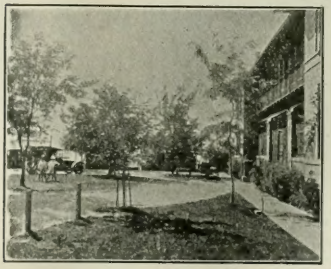

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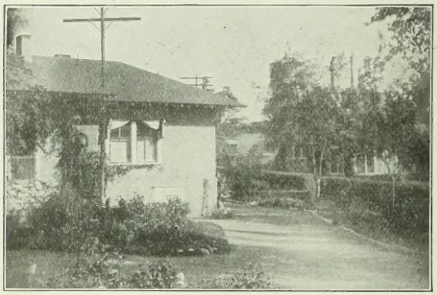

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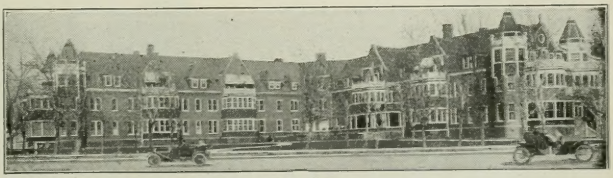

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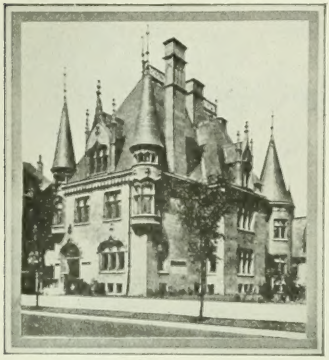

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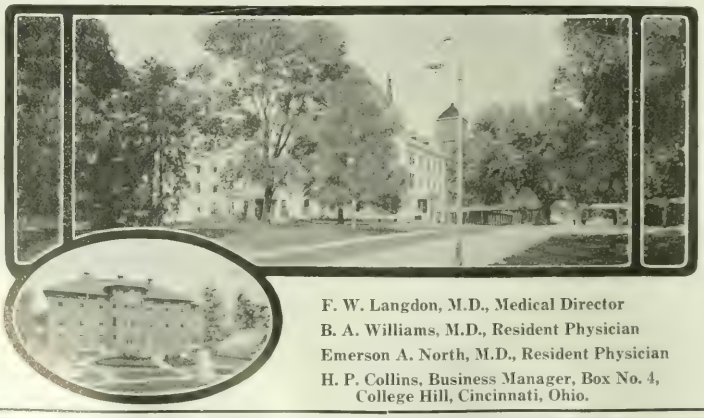

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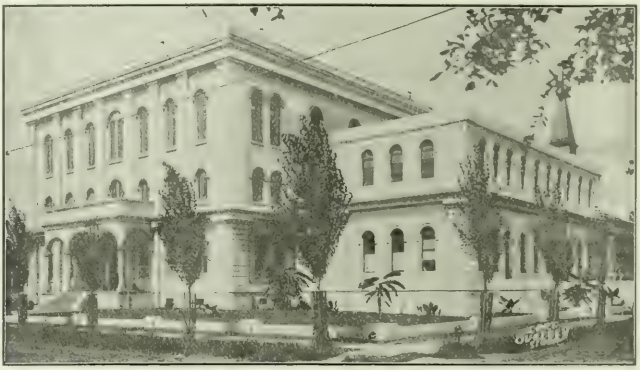

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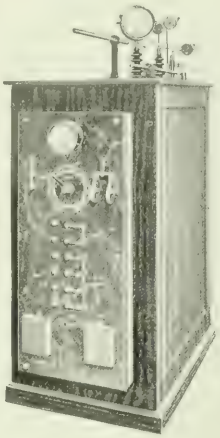

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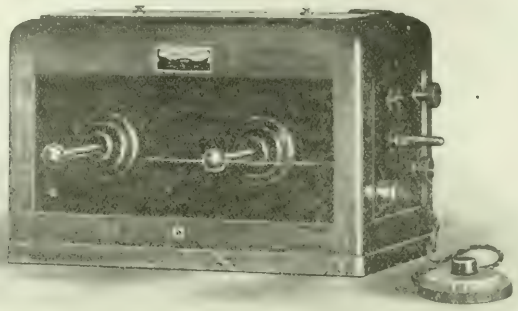

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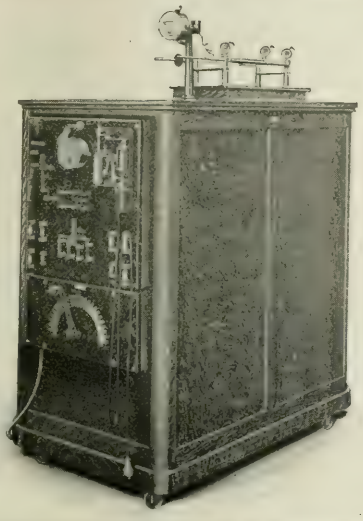

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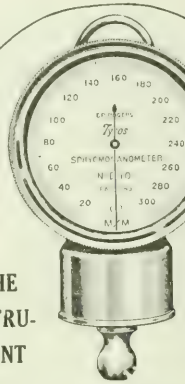


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# MEDICINE

## (INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

### THE TRANSMISSIBILITY OF PELLAGRA — EXPERIMENTAL ATTEMPTS AT TRANSMISSION TO THE HUMAN SUBJECT*

By Joseph Goldberger, M.D.,
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There is a very widely held belief, at least in the United States, that pellagra is a communicable disease. The evidence in support of this is almost wholly indirect and consists, in the main, of certain analogies to infectious diseases presented by some features of its epidemiology. When critically examined one finds that this evidence either completely falls or that it is susceptible of an entirely different interpretation[1]. The only direct evidence in favor of this view that calls for serious consideration is the report by Harris (1913), of New Orleans, of a successful inoculation of a monkey with a filtrate from pellagrous lesions.

The very extensive and comprehensive monkey inoculations by Lavinder and Francis (1914), like those of a number of other workers, including the later (unpublished) work[2] of Harris himself, have failed to confirm this report.

In order to throw further and, if possible, conclusive light on this subject, the writer planned to test the question of the infectivity of the disease by experiment on an animal species known to be susceptible, namely, man himself.

This was made possible by the co-operation of a number of my colleagues and associates who, after being informed of the problem, freely volunteered to submit themselves to experiment. It was originally planned to carry out this test during 1915 concurrently with a test of the role of diet in the production of pellagra (Goldberger and Wheeler, 1915) to which a group of convicts were at that time being subjected. The pressure of other work, however, made it necessary to defer this phase of the investigation until the spring of the present year.

#### GENERAL CONSIDERATIONS

Some 20 individuals volunteered to submit themselves to experimentation. It was not practicable, however, to utilize more than 16 of them. These included 1 woman.

They varied in age from 26 to 42 years. Four were 26 to 29, 9 from 30 to 39, and 3 from 40 to 42 years. Thirteen were physicians. They resided in various localities: Eight at Washington, D. C.; 1 at Columbia, S. C.; 2 at Spartanburg, S. C.; 1 at Milledgeville, Ga.; and 4 at New Orleans, La.

No restraint of any sort was imposed. They were advised to continue their customary habits of life and diet, and were

*Read in Section on Medicine, Symposium on Pellagra, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

1. A discussion of the literature is reserved for a later communication. In the meantime the reader will find the following of interest: Goldberger, 1915; Vedder, 1916; and Voegtlin, 1914.

2. Communicated at a meeting of Louisiana health officers, New Orleans, July, 1915.

permitted to travel freely in attending to their personal or official business.

No attempt was made to avoid "natural infection." Indeed, it should be noted that five of the volunteers by reason of their official duties came into frequent and intimate contact with pellagra in its natural environment. Three, including the woman, have come into known contact with cases of the disease, while four others have lived for considerable periods in a locality (New Orleans) where casual contact with the disease was at least a possibility.

In the appended list of the volunteers will be found the age, location of residence, and an indication of the experiments in which each participated.

The materials used were blood, nasopharyngeal secretions, epidermal scales from pellagrous skin lesions, urine, and feces. The blood was administered by intramuscular or subcutaneous injection, the secretions by application to the mucosa of the nose and nasopharynx, scales, and excreta by mouth.

In order to reduce gastric acidity and thus minimize the possibly germicidal effect of the gastric juice, the ingestion of scales and excreta was preceded by a dose of from 10 to 20 grains of sodium bicarbonate. The ingesta were always taken on an otherwise empty stomach.

The materials whose infectivity was tested were obtained from 17 cases of pellagra of various types and of different grades of severity, including three fatal cases. A list is appended in which the pertinent data relating to each case are given.

The patients were seen and the experiments performed at different places. One, a fatal case, was seen at the Washington Asylum Hospital, Washington, D. C.; 1 at the Charity Hospital, New Orleans, La.; 3 at the State Hospital for Insane at Columbia, S. C.; and 12, including 2 fatal cases, at Spartanburg, S. C. The volunteers participating did not in all instances reside at the place where the experiment was performed, but assembled there at a specified time. This applies particularly to the experiments at Spartanburg, S. C.

## DETAILS

As will appear from the details next to be presented, the infectivity of the blood was tested twice, of nasophrayngeal secretions twice, of scales three times, and by reason of the alleged controlling influence of methods of sewage disposal in the propagation of the disease the infectivity of both urine and feces was tested six times. Two or more of these tests were made on seven different occasions. In presenting the details of the experiments it seems best to consider the individual experiment under the group of which it formed a part on one of these seven occasions. The groups are considered in their chronological sequence. A tabular summary is appended.

### EXPERIMENT GROUP NO. 1

On April 25, 1916, blood and nasopharyngeal secretions were obtained from a patient (case No. 1) with a moderately acute first attack of the disease at the United States Pellagra Hospital, Spartanburg, S. C., and administered to two volunteers, G-J and W-GA.

(*a*) *Blood.*—The blood was drawn from a vein at one of the elbows, defibrinated and 5 c. c. were injected without delay into the left deltoid of W-GA and 6 c. c. into that of G-J.

(*b*) *Secretions.*—Secretions were obtained by wiping out the nose and nasopharynx of the patient with a cotton swab and transferred by at once rubbing this over the mucosa of the nose and nasopharynx of the volunteer. A separate swab was used for each.

*Effects.*—Both men felt some soreness and stiffness for a day or two in the muscle into which the blood was injected; otherwise nothing was observed.

### EXPERIMENT GROUP NO. 2

On April 28, epidermal scales and urine were obtained from each of two patients and feces from a third at the State Hospital for Insane at Columbia, S. C.

Of the two patients furnishing both scales and urine, one (case No. 3) was a severe first attack and the other (case No. 4) a mild second attack. The patient furnishing the feces (case No. 2) was suffering from a severe attack and was having four soft bowel movements a day.

(*a*) *Scales.*—The scales were obtained by scraping the affected areas of the skin and, combined, weighed, it is estimated, about 0.1 to 0.2 gms.

(*b*) *Urine.*—The urine was a fresh catheter specimen in each case.

(*c*) *Feces.*—The feces specimen was obtained with the aid of a simple water enema and was liquid.

The scales with about 4 c. c. of each specimen of urine and with about the same quantity of the liquid feces were worked up into a pilular mass with wheat flour and in this form swallowed by volunteer G-J, 30 minutes after taking 20 grains of sodium bicarbonate and about 1 to 1½ hours after collecting. After swallowing this mass another dose of 20 grains of sodium bicarbonate was taken. The alkali, as already stated, was intended to reduce gastric acidity and thus perhaps favor infection.

*Effects.*—For several days after the ingestion of the foregoing materials this volunteer experienced some slight epigastric fullness and eructations of gas after a meal. On the third day a diarrhea with frequent, painless, watery, and rather gaseous evacuations developed. The diarrhea lasted about a week. It was still present on May 7, on which date, as will presently appear, this volunteer participated in another experiment which included the ingestion of scales, urine, and feces.

EXPERIMENT GROUP NO. 3

On May 7 blood, nasopharyngeal secretions, scales, urine, and feces were obtained from some patients at the United States Pellagra Hospital, Spartanburg, S. C., and used for the inoculation of each of a group of five volunteers, G-J, S-E, T-WF, W-DG, and W-GA. A sixth volunteer, G-MHF, received blood only.

(*a*) *Blood.*—The blood was drawn from the general circulation of each of three patients, defibrinated and then pooled. Of this, 7 c. c. were injected subcutaneously into each of the six volunteers mentioned. The time elapsing between drawing and injecting the blood was under two hours.

To the pooled blood, one of the patients (case No. 5), with a mild ninth recurrent attack, contributed 10 c. c.; one (case No. 6), with a moderately acute second attack, 15.5 c. c.; and one (case No. 7), with a severe acute second attack, 20 c. c. The patients furnished, therefore, 1.5 c. c., 2.5 c. c., and 3 c. c., respectively, of defibrinated blood for the inoculation of each volunteer.

(*b*) *Secretions.*—Secretions were obtained from four patients and, after mixing, used for the inoculation of the five men above mentioned. One of the patients (case No. 1) was the same as the one that furnished the secretions for the first experiment (experiment group No. 1, b). The three others are cases No. 5, No. 6, and No. 7, already briefly characterized in describing the immediately preceding blood inoculation.

The nose and nasopharynx of each of the four patients were carefully wiped out with a separate set of five cotton swabs. The secretions thus obtained were mixed by rinsing and soaking the swabs in some normal salt solution.

The inoculation was made by rubbing over the mucosa of each side of the nose and nasopharynx each of a set of three swabs soaked in the mixture just described. In this way a fresh set of six swabs was used for each volunteer. The time elapsing between collecting and inoculating was less than two hours. Incidentally it should perhaps be noted that some of the secretions applied to the nasopharynx must have been, eventually, swallowed.

(*c*) *Scales.*—The scales were freshly scraped from affected areas of skin of two patients, cases No. 1 and No. 7, previously characterized. Case No. 1 furnished 0.1 gm. and No. 7, 0.22 gms.

These were mixed and then divided approximately equally among the five volunteers, each of whom swallowed his portion in the form of a "powder" about seven hours after they were collected and shortly after taking the dose of urine and feces next to be described.

(*d*) *Urine; feces.*—A specimen of urine and one of feces was obtained from each of the same three patients (cases No. 5, No. 6, and No. 7) who furnished the blood. In order to make sure of having the feces when wanted a simple water enema was used to get the specimens, none of which was diarrheal.

Ten cubic centimeters of urine and 5 grams of solid feces from each of the three corresponding specimens were worked up into a pilular mass with flour. About 15 minutes after taking 20 grains of sodium bicarbonate each of the five volunteers ingested an approximately equal portion of the mass. Each took therefore the equivalent of about 2 c. c. of urine and 1 gram

## *Tabular Summary of Experiments*

| Date. | Locality. | Material. Kind | Source (case). | Amount. | Manner of Administration | Volunteer subject | Remarks. Time interval. | Result |
|---|---|---|---|---|---|---|---|---|
| 1916. | | | | | | | | |
| Apr. 27 | Spartanburg, S. C. | Defibrinated blood | No. 1. | 5 c. c. and 6 c. c. | Intramuscular injection | W-GA, G-J | The blood was injected intramuscularly within a few minutes after defibrination. | No pellagra. |
| | | Nasophar. Secretions | ----do | (?) | Applied to mucosa of nose and nasopharynx. | W-GA, G-J | Secretions obtained on cotton swab and at once rubbed over mucosa of subject. Fresh swab used for each subject. | Do. |
| Apr. 28 | Columbia, S. C. | Scales, Urine, Feces | No. 3 and No. 4; No. 2 | 0.1 to 0.2 gm., 8 c. c., 4 c. c. | Swallowed | G-J. | Scales taken as "powder." Feces and urine made up into pilular mass with wheat flour and ingested. The quantities are minimal estimates. Interval 1 to 1 1-2 hours. | Do. |
| May 7 | Spartanburg, S. C. | Defibrinated Blood | No. 5, No. 6, and No. 7. | 7 c. c. | Subcutaneous injection. | G-J, G-MHF, S-E, T-WF, W-DG, W-GA | Case No. 5 furnished 10 c. c., No. 6 furnished 15.5 c. c., and No. 7 furnished 20 c. c. of defibrinated blood. Of the pooled blood 7 c. c. were subcutaneously injected into each subject. The time between drawing and injecting the blood was under two hours. | Do. |
| | | Nasophar. Secretions | No. 1, No. 5, No. 6, and No. 7. | (?) | Rubbed into mucosa of nose and nasopharynx. | G-J, S-E, T-WF, W-DG, W-GA | Secretions freshly obtained by swabbing out the nose and nasopharynx in each case with a set of 5 cotton swabs and soaking these in saline solution. Six fresh swabs wet with this secretion were rubbed over nasal and nasopharyngeal mucosa of each volunteer. Interval less than 2 hours. | Do. |
| | | Scales | No. 1, and No. 7 | 0.06 gm. | Swallowed | G-J, S-E, T-WF, W-DG, W-GA | Case No. 1 furnished 0.1 gm. and No. 7, 0.22 gm. of freshly scraped scales. These were mixed and divided into five approximately equal parts and swallowed about 7 hours after they were collected | Do. |
| | | Urine, Feces | No. 5, No. 6, and No. 7. | 6 c. c., 3 gms. | do | G-J, S-E, T-WF, W-DG, W-GA | Urine and feces rubbed into a pilular mass with wheat flour. Each volunteer swallowed a portion representing 3 gms. of feces (1 gm. from each case) and 6 c. c. of urine (2 c. c. from each case). Urine and feces 3 to 9 hours old when swallowed. | Do. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| June 7 | Washington, D. C. | Urine | No. 8 | 10 c. c. | C-RH, D-WF, McC-GW, G-J, S-AM | Urine and feces worked up into a pilular mass with cracker crumbs and a little flour. The urine was not over 4 hours old when ingested; each volunteer received 2 c. c. The feces consisted of two specimens, one 15 hours and the other about 5 hours old; of the former each volunteer took 0.2 gm., of the latter 1 gm. | Do. |
| | | Feces | | 1.2 gms. | | | |
| June 8 | do | Urine | No. 8 | 10 c. c. | G-J, S-EA | Urine and feces prepared with cracker crumbs and a little flour. Urine was 3 hours old. The feces included 3 specimens, one 39 hours old, the second 22 hours, and the third about 5 hours old. Each volunteer took 2 c. c. of urine and 1 gm. of each fecal specimen. | Do. |
| | | Feces | | 3 gms. | | | |
| June 12 | New Orleans, La. | Urine | No. 9 | 10 c. c. | A-CW, G-J, L-JR, M-MB, W-CL | Urine and feces prepared with cracker crumbs and flour. Urine was about 5 1-2 hours old. Feces were liquid, following saline purge. Each volunteer took 2 c. c. of urine with 2 c. c. of feces. | Do. |
| | | Feces | | 2 c. c. | | | |
| June 15 | Spartanburg, S. C. | Scales | Nos. 11 and 17 | 0.001 gms. | G-J, S-E, W-GA | Scales, urine, and feces were worked up into a pilular mass with cracker crumbs. The scales were not over 4 hours old and each volunteer took about 0.001 gms. The urine and feces were not over 6 hours old. Of the latter each volunteer took about 1 c. c. from each case of the feces 1 gm. from each of six cases and 2 gms. from the seventh (case No. 13). | Do. |
| | | Urine | Nos. 10, 11, 12, 14, 15, 16, 17 | 6 c. c. | | | |
| | | Feces | Nos. 10, 11, 12, 13, 14, 15, 16 | 5 gms. | | | |

of feces from each of the three patients.

The urine and fecal specimens were between 3 and 9 hours old when ingested.

*Effects.*—About 10 days after inoculation, one of the volunteers, T-WF, noted a slightly enlarged and somewhat tender lymph gland above the Poupart's ligament of the side of the abdomen that was the site of the blood injection. This gradually subsided. None of the other volunteers experienced any inconvenience, although, as will be recalled, one of them (G-J), on the date of this experiment, had not yet completely recovered from a rather marked attack of diarrhea following a previous ingestion experiment.

### EXPERIMENT GROUP NO. 4

On June 7, 1916, urine and feces were obtained from a patient (female) at the Washington Asylum Hospital, Washington, D. C. The patient (case No. 8) had a typhoidal first attack, from which she died 10 days later (June 17, 1916).

The urine was a catheter specimen, drawn at 8:45 A. M. June 7.

The fecal matter consisted of two specimens—one ,fairly liquid, was passed at about 9 P. M. June 6; the second, of soft puttylike consistency, was passed about 7 A. M. June 7.

Ten cubic centimeters of the urine, 1 gram of the first and 5 grams of the second fecal specimen were worked up into a pilular mass with cracker crums and a little flour. Gelatin capsules were filled, approximately equally divided, and at 12:30 P. M. ingested by five volunteers, C-RH, D-WF, McC-GW, G-J, S-AM. Fifteen minutes before this each volunteer took 10 grains of sodium bicarbonate.

*Effects.*—Some hours after ingesting the above one of the volunteers, S-AM, developed abdominal discomfort accompanied by abnormal, gaseous evacuations. The movements increased in frequency, developing into a marked diarrhea, which lasted about two weeks. He has been well since.

Another, McC-GW, experienced a little temporary gastric discomfort immediately after taking the material; nothing of note since.

None of the others of this group experienced any appreciable effects.

### EXPERIMENT GROUP NO. 5

On June 8, 1916, another experiment

was made with urine and feces from the patient (case No. 8) furnishing these materials for the preceding experiment, No. 7.

On this occasion the fecal matter consisted of three specimens. One of these, now 39 hours old, was passed at 7 A. M. June 7, and had served in experiment No. 4; it had been kept at room temperature. The second was passed at 11:30 P. M. June 7, and the third at 7:15 A. M. June 8. Both of these latter specimens were liquid.

A urine specimen was drawn by catheter at 8:45 A. M. June 8.

Three grams of the first, 3 c. c. of the second, and 3 c. c. of the third fecal specimen, with 6 c. c. of urine, were prepared as in the preceding experiment, and at 12 o'clock equally divided among the three volunteers G-J, L-JP, and S-EA. Each received, therefore, the equivalent of 1 gram of each of the three fecal specimens and of 2 c. c. of the urine. About 20 minutes before taking this material each volunteer had taken 10 grains of sodium bicarbonate.

*Effects.*—Although two of these volunteers (L-JP and S-EA) had temporary attacks of looseness of the bowels immediately preceding the experiment, neither they nor the third who had participated in each of the preceding ingestion experiments experienced any inconvenience following the ingestion of this experimental material.

EXPERIMENT GROUP NO. 6

On June 13, 1916, urine and feces were obtained from a patient at the Charity Hospital, New Orleans, La. This patient (case No. 9) had a mild first attack.

The urine was obtained by catheter at 8 A. M. The stool, a liquid one, was passed at about 7:15 A. M., after a dose of magnesium sulphate.

Measured quantities of this material were prepared as in experiments No. 4 and No. 5 at 1:20 P. M. and ingested by five volunteers, A-CW, G-J, L-GB, M-MB, and W-CL, each one getting the equivalent of 2 c. c. of feces and 2 c. c. of urine. Twenty-five minutes before taking this material each volunteer took 20 grains of sodium bicarbonate.

*Effects.*—None of this group of volunteers experienced any appreciable effects.

EXPERIMENT GROUP NO. 7

On June 25, 1916, material was obtained at Spartanburg, S. C., for a final experiment.

(*a*) *Scales.*—Epidermal scales were scraped from pellagrous skin lesions of two patients (cases No. 14 and No. 17) at the United States Pellagra Hospital. They were not over four hours old when ingested.

(*b*) *Urine.*—Urine was obtained from three patients (cases No. 10, No. 11, and No. 12) at the county farm and from these three (cases No. 14, No. 15, and No. 17) at the Pellagra Hospital.

(*c*) *Feces.*—Feces were obtained from four patients (cases No. 10, No. 11, No. 12, and No. 13) at the county farm and from three (cases No. 14, No. 15, and No. 16) at the Pellagra Hospital. Two of the fecal specimens were from patients (cases Nos. 12 and 13) with diarrhea.

The seven patients who furnished the material for this experiment were suffering from attacks of varying grades of severity (see list of pellagra cases), including two fatal cases (No. 12 and No. 13).

Measured quantities of the materials mentioned were worked up with cracker crumbs and a little flour into a pilular mass. Fifteen minutes after taking a dose of 20 grains of sodium bicarbonate this was ingested by each of the three volunteers, G-J, S-E, and W-GA, each taking the equivalent of about 4 milligrams of scales, 6 c. c. of urine (1 c. c. from each patient), and 8 grams of feces (2 grams from case No. 13 and 1 gram from each of the other six patients). The feces and urine were not over six hours old when ingested.

*Effects.*—Volunteer G-J, who participated in all of the preceding experiments and who, as was noted, had an attack of indigestion and diarrhea for about one week following the first ingestion experiment, experienced some mild dyspeptic symptoms for a number of days immediately after this.

Within two or three hours after the experiment volunteer S-E began to feel nauseated. The following morning he had three watery evacuations and 12 hours later a diarrhea began that lasted about a week. Nausea persisted for about the same period.

Volunteer W-GA had some slight ill-defined dyspeptic symptoms for about 24 hours following the experiment.

Aside from these immediate, temporary disturbances none of the volunteers has experienced any appreciable effects.

## RESULTS AND CONCLUSIONS

The first experiment was made on April 25 and the last on June 25, so that the volunteers have now (Nov. 16, 1916) been under observation for from four and one-half to six and one-half months approximately. Observation has been maintained by association with a majority of the volunteers, by visits of inspection to the others, supplemented by reports from the volunteers themselves, or in the case of the laymen from medical officers with whom they are associated.

In four or five instances, as above noted, there were more or less marked immediate, but temporary, gastrointestinal reactions following and probably due to the ingestion of the large doses of excreta. When one considers the relatively enormous quantities of filth taken the reactions experienced were surprisingly slight.

One of the volunteers, S-EA, had an attack of renal colic of eight to nine days' duration, from August 14 to August 22, 1916. Aside from this he, as well as the other volunteers, has enjoyed his usual health. None has developed any evidence justifying even a suspicion of pellagra.

It is not my present purpose to enter into a discussion of the etiology of pellagra. I may be permitted, however, to recall by way of contrast the result of the feeding experiment carried out last year (Goldberger and Wheeler, 1915). In that experiment, of 11 convicts subsisting on a one-sided diet not less than 6 developed definite evidence of pellagra, while of over 30 controls not one showed any evidence that would justify even a suspicion of the disease.

It would appear, then, that while the opinion that pellagra is a communicable disease gains no support from the work here reported, the conclusion elsewhere drawn (Goldberger, 1916), that it is a disease essentially of dietary origin, brought about by a faulty, probably "deficient," diet is materially strengthened.

## SUMMARY

Sixteen volunteers were subjected to experiment. With one exception all were men and varied in age from 26 to 42 years. No restraints were imposed on their customary habits or activities.

Seventeen cases of pellagra of various types and of different grades of severity furnished some one or more of the experimental materials.

The materials were blood, nasopharyngeal secretions, epidermal scales from pellagrous lesions, urine, and feces. Blood was furnished by 4 of the cases, nasopharyngeal secretions by 4, epidermal scales by 5, and urine or feces by 16, of whom 10 furnished both urine and feces, 3 urine without feces, and 3 feces without urine.

Blood was administered by intramuscular or subcutaneous injection; secretions by application to the mucosa of the nose and nasopharynx; scales and excreta by mouth.

Both urine and feces were ingested by 15 of the volunteers, 5 of whom also took blood, secretions, and scales.

The experiments were performed at four widely separated localities (Washington, D. C.; Columbia, S. C.; Spartanburg, S. C.; and New Orleans, La.), at which different groups of the volunteers were assembled.

Observation has been maintained by association with a majority of the volunteers and by visits of inspection, supplemented by reports from the volunteers themselves, 13 of whom are physicians, and by reports from other medical officers of the service with whom they are associated. During a period of between five and seven months none has developed evidence justifying a diagnosis of pellagra.

These experiments furnish no support for the view that pellagra is a communicable disease; they materially strengthen the conclusion that it is a disease essentially of dietary origin, brought about by a faulty, probably "deficient" diet.

## ACKNOWLEDGMENTS

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I have, finally, to make grateful acknowledgment of my indebtedness to those of my colleagues and associates of the service whose willing participation in a trying ordeal made this work possible.

VOLUNTEERS

A-CV.—Medical officer, 26 years. Stationed at New Orleans, La. Participated in experiment No. 6.

C-RH.—Medical officer, 37 years. Stationed at Washington, D. C. Participated in experiment No. 4.

D-WF.—Medical officer, 32 years. Stationed at Washington, D. C. Participated in experiment No. 4.

G-J.—Medical officer, 42 years. Stationed at Washington, D. C. Major part of the time spent in field work in Southern states. Participated in all seven experiments.

G-MHF.—Housewife, 35 years. Resides at Washington, D. C. The only woman among the volunteers. Participated in experiment No. 3 at Spartanburg, S. C.

L-JB.—Medical officer, 28 years. Stationed at New Orleans. Participated in experiment No. 6.

L-JP.—Medical officer, 35 years. Stationed at Washington, D. C. Participated in experiment No. 5.

McC-GW.—Medical officer, 40 years. Stationed at Washington, D. C. Participated in experiment No. 4.

M-MB.—Technical assistant, 33 years. Stationed at New Orleans, La. Participated in experiment No. 6.

S-AM.—Medical officer, 39 years. Stationed at Washington, D. C. Participated in experiment No. 4.

S-E.—Statistician, 35 years. Stationed at Spartanburg, S. C. Participated in experiments No. 3 and No. 7.

S-EA.—Medical officer, 39 years. Stationed at Washington, D. C. Had an attack of renal colic August 14-22, 1916. Participated in experiment No. 5.

T-WF.—Medical officer, 28 years. Stationed at Columbia and Spartanburg, S. C. Participated in experiment No. 3.

W-CL.—Medical officer, 28 years. Stationed at New Orleans, La., up to September 12; at San Francisco after that date. Participated in experiment No. 6.

W-DG.—Assistant epidemiologist, 42 years. Stationed at Milledgeville, Ga. Participated in experiment No. 3.

W-W[illegible]lical officer, 31 years. Stationed at S[illegible] S. C. Participated in experiments No. 1, No. 3, and No. 7.

PELLAGRA CASES

No. 1

W-S.—White female admitted to United States Pellagra Hospital, Spartanburg, S. C., April 14, 1916. Hospital No. 191.

*Salient clinical features.*—Weakness, moderate skin lesions which first appeared April 7, 1916, moderate diarrhea.

*Severity.*—Rated by Dr. R. M. Grimm, the medical officer in charge, as a moderately acute first attack.

*Experimental material.*—Furnished blood and nasopharyngeal secretions on April 25 and epidermal scales and nasopharyngeal secretions on May 7.

No. 2

M-FN.—White male, Ward 4, Columbia State Hospital, Columbia, S. C. Service of Dr. J. T. Munnerlyn. Admitted February, 1916.

*Salient clinical features.*—History of illness of two years. Insane. Presents marked seborrhea of nose and lips. Dermatitis on both elbows, with encircling "areola" on left. Has about four soft movements a day.

*Severity.*—Rated by Dr. Munnerlyn as a "severe" case.

*Experimental material.*—Furnished feces on April 28, 1916.

No. 3

L-JL.—White female, Ward A12, Columbia State Hospital, Columbia, S. C. Service of Dr. D. W. Register. Admitted February, 1916.

*Salient clinical features.*—Mental manifestations, eruption, red tongue.

*Severity.*—Rated by Dr. Register as a "severe" first attack.

*Experimental material.*—Furnished epidermal scales and urine April 28, 1916.

No. 4

M-MC.—White female, Ward A12, Columbia State Hospital, Columbia, S. C. Service of Dr. D. W. Register.

*Salient clinical features.*—Mental manifestations, extensive eruption. History of an attack in 1914.

*Severity.*—Rated by Dr. Register as a "mild" second attack.

*Experimental material.*—Furnished epidermal scales and urine on April 28, 1916.

No. 5

E-EA.—White male, admitted to United States Pellagra Hospital, Spartanburg, S. C., May 5, 1916. Hospital No. 24, 24a, 24b.

*Salient clinical features.*—History of first attack in 1908; present is ninth attack and is said to have begun about April 15, 1916. Presents mild skin and minor nervous manifestations, marked weakness, constipated.

*Severity.*—Rated by Dr. Grimm as a mild, acute ninth recurrence.

*Experimental material.*—Furnished nasopharyngeal secretion, urine, feces, and blood on May 7, 1916.

No. 6

O-I.—White female, admitted to United States Pellagra Hospital May 6, 1916. Hospital No. 195.

*Salient clinical features.*—Weakness, moderately severe skin manifestations, moderate

"nervousness," vertigo, mild salivation. History of first attack April, 1915.

*Severity.*—Rated by Dr. Grimm as a moderately acute second attack.

*Experimental material.*—Furnished nasopharyngeal secretions, urine, feces, and blood on May 7, 1916.

No. 7

S-H.—White male, 8 years old. Admitted to United States Pellagra Hospital April 26, 1916. Hospital No. 193.

*Salient clinical features.*—Severe extensive skin manifestations, some of moist type. Mentally dull and depressed. History of a first attack in spring of 1915.

*Severity.*—Rated by Dr. Grimm as a severe acute second attack.

*Experimental material.*—Furnished nasopharyngeal secretions, bloood, urine, and feces on May 7, 1916.

No. 8

S-M.—White female, 48 years old. Admitted to Washington Asylum Hospital, Washington, D. C., April 27, 1916. Service of Dr. W. M. Barton; resident physician, Dr. Reiss.

*Salient clinical features.*—Mild skin manifestations, beefy tongue, diarrhea, involuntary evacuations, disoriented, typhoidal.

*Severity.*—A typhoid-pellagra, fatal; died June 17, 1916.

*Experimental material.*—Furnished two specimens of feces for experiment on June 7, 1916. One, fairly liquid, was passed at 9 P. M. June 6; the second, more nearly solid, at 7 A. M. June 7. Also a specimen of urine drawn at 8:45 A. M. June 7.

For the experiment of June 8, besides the second of the preceding fecal specimens, which was preserved at air temperature, this patient furnished two additional stools, both fluid, one passed at 11:30 P. M. June 7 and the other at 7:15 P. M. June 8. Also a specimen of urine drawn at 8:45 A. M. June 8, 1916.

No. 9

B-M.—Colored male, 74 years. Admitted to Charity Hospital, New Orleans, La., June 11, 1916, ward No. 31, bed 405. Service of Dr. I. I. Lemmon; resident physician, Dr. C. Dean.

*Salient clinical features.*—Minor nervous manifestations, mild dermatitis, history of loose bowels.

*Severity.*—A mild first attack.

*Experimental material.*—Furnished feces and urine. Stool, liquid, after saline purge, passed about 7:15 A. M.; urine drawn at 8 A. M. June 13, 1916.

No. 10

K-L.—White male, 11 years. Admitted to Spartanburg County Farm June 16, 1916. Service of Dr. O. W. Leonard.

*Salient clinical features.*—Extensive marked skin manifestations; mild gastrointestinal symptoms.

*Severity.*—A well-marked first attack of moderate grade.

*Experimental material.*—Furnished urine and feces June 25, 1916.

No. 11

K-OB.—White male, 43 years. Admitted to Spartanburg County Farm June 16, 1916. Service of Dr. O. W. Leonard.

*Salient clinical features.*—Extensive severe skin manifestations; mild buccal and gastric symptoms; constipated.

*Severity.*—A well-marked first attack of medium grade.

*Experimental material.*—Furnished urine and feces June 25, 1916.

No. 12

K-O.—White female, 9 years. Admitted to Spartanburg County Farm June 16, 1916. Service of Dr. O. W. Leonard.

*Salient clinical features.*—Extensive severe skin manifestations; marked diarrhea.

*Severity.*—A fatal first attack. Died August 25, 1916.

*Experimental material.*—Furnished urine and feces June 25, 1916.

No. 13

S-JE.—White male, 37 years. Admitted to Spartanburg County Farm June 10, 1916. Service of Dr. O. W. Leonard.

*Salient clinical features.*—Has a history of pellagra extending over six to seven years; mental manifestations winter 1915-16.

Presents well-marked eruption; marked buccal and severe intestinal symptoms (watery diarrhea).

*Severity.*—A chronic pellagra, fatal. Died August 1, 1916.

*Experimental material.*—Furnished feces June 25, 1916.

No. 14

J-M.—White female, 33 years. Out patient No. 43, United States Pellagra Hospital, Spartanburg, S. C. Came under observation June 19, 1916.

*Salient clinical features.*—Weak, tongue slightly red, constipated; moderately extensive, active eruption. History of attack in 1912 and 1915.

*Severity.*—Rated by Dr. Grimm as a moderately acute third recurrent attack.

*Experimental material.*—Furnished epidermal scales, urine, and feces June 25, 1916.

No. 15

H-V.—White female, 21 years. Admitted to United States Pellagra Hospital, Spartanburg, S. C., June 24, 1916. Hospital No. 212.

*Salient clinical features.*—Presents moderately extensive, acute skin manifestations; mild mental symptoms (apathetic, confused). History of a first attack in June, 1915.

*Severity.*—Dr. Grimm rates this as a moderately acute second attack.

*Experimental material.*—Furnished urine and feces June 25, 1916.

No. 16

S-S.—White female, 30 years. Admitted to United States Pellagra Hospital, Spartanburg, S. C., June 24, 1916.

*Salient clinical features.*—History of an attack, 1915, and of a recurrence in March, 1916, followed by improvement in April, but with retrogression during May and June. On admission felt weak, nervous, without nausea, but with burning and pain in stomach and with burning of feet. No other gastrointestinal manifestations. No eruptions nor residuals of one.

*Severity.*—Mild second attack in posteruptive stage (or in interval) with mild suggestive symptoms.

*Experimental material.*—Furnished urine and feces June 25, 1916.

No. 17

Q-LV.—White female, 25 years. Admitted to United States Pellagra Hospital, Spartanburg, S. C., June 24, 1916. Hospital No. 216.

*Salient clinical features.*—Presents definite skin eruption and mild suggestive symptoms (nervousness, weakness).

Gives history of an attack in 1913 and of one in 1915.

*Severity.*—Rated by Dr. Grimm as a mild third recurrent attack.

*Experimental material.*—Furnished epidermal scales and urine June 25, 1916.

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Editor's Note: This is the first paper of a Symposium on Pellagra. Two appear in this issue. The remaining two, with all the discussions, will appear in a future issue, probably in May.

## THE PELLAGROUS INTESTINE AND SOME OF ITS PARASITES*

By Kenneth M. Lynch, M.D.,
Charleston, S. C.

### THE INTESTINE OF PELLAGRA

According to observations of various writers, the morbid changes which may occur in the intestine in pellagra are of such varied character as to indicate that there may be no common ground on which they may be gathered into a type any more distinctive of pellagra than of various other diseases.

From the study of pellagra in Charleston, I have come to consider the intestinal change of much more importance in the pathology of the disease than is generally accorded it. In fact, it has been of such character as to give to the term "pellagrous intestine" a definite meaning.

During the past two years I have autopsied the bodies of thirty-two pellagrins, all being Negroes and ranging from childhood to old age, and about equally divided between the sexes. In these bodies the only recognized constant morbid change was in the intestine.

Clinically, the cases have all been in an active stage of the disease, the majority of the subacute type, some in their first attack, and some that had been in the Hospital before. Some of them had diarrhea, some had not, and some were constipated. The activity of the bowel has not appeared to have a direct relationship to the grade of enteritis, since marked intestinal changes have been observed in those that were constipated.

The characteristic change, which has occurred most distinctly in the subacute cases, is practically limited to the large intestine,—the cecum, sigmoid, and rectum being its particular seats. In the most severe cases sometimes an extension into the lower end of the ileum occurs.

The content of the large bowel is usually semi-fluid, of a yellowish granular character, not commonly in large amount, and rarely mucinous.

The cecum may be large, but the remainder of the large gut is commonly contracted. The mucosa is somewhat swollen, but firm and rather smoothed out on the surface. The inner surface is often hyperemic, and commonly of a deep red color, this color being most marked in the cecum, sigmoid and rectum. There is rarely any noticeable mucus on the lining. At times minute gross ulcerations of the elevated points and rarely irregular superficial ulcers with a clean red granular base and irregular, clean-cut edges which are not necrotic or undermined are seen. This ulcer is not of the amebic type and no ameba has been found in the cases showing it. The wall as a whole is usually thickened. The peritoneal surface is usu-

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ally smooth and glistening and not uncommonly is indurated. This induration may extend to the tissues surrounding the rectum.

Microscopically, the outer coat shows a fibrosis which may be of minor or marked degree. It is commonly of distinctly progressive proportions, showing more cells than the normal. In the muscular coat there is an infiltration with lymphocytes and an overgrowth of connective tissue between the bundles of muscle. This feature varies and the muscle may be of normal proportions or considerably atrophied and replaced. In some cases perivascular foci of subacute inflammation in the muscular coat are marked. In the submucosa there is an increase in connective tissue with a lymphoid infiltration, and it may be loose from edema. The lymphoid element varies in amount and sometimes there occurs localization. These collections of lymphocytes, plasma cells, and connective tissue are similar to those seen in focal infections of subacute or chronic nature. The surface epithelium of the mucosa exhibits varying grades of degeneration and desquamation. Some of the glands are normal, others are atrophied, and still others are dilated and cystic. The fibrous tissue overgrowth and lymphocytosis varies, it being marked in some, and frequently showing the localization foci. The hyperemia is most marked in the mucosa, less so in the submucosa, and little noticed in the outer coats. When ulcers occur they are superficial, have clean-cut edges, and a smooth base of connective tissue, lymphocytes and plasma cells. In some cases there is no distinct gross ulcer, but in microscopic sections considerable areas of total loss of epithelium and glands are seen, leaving a surface composed of granulation tissue in which a prominent part is played by lymphocytes and plasma cells.

This is the type of the colitis and the variation is in degree and extent. In some the cecum, sigmoid, and rectum are the only parts involved; in some only one of these parts is affected; and in others the involvement of the large intestine is general. In the chronic case there may be an atrophy of the intestine in keeping with the general emaciation; and in the acute there may be an added acute catarrh showing no distinctive feature.

The grade of the inflammation is usually in direct proportion to the severity of the clinical symptoms, but this is not constant.

While I consider the etiology of pellagra still an open question, the intestine here described bears the earmarks of a particular infection. Whether this infection is of primary or secondary importance will, of course, remain unanswered until the etiological factor is determined. If the disease is one of dietary fault, the intestinal field must thereby be prepared for the action of an organism or organisms normally not present or insufficient, and this must have been constant in this series of cases. On the other hand, if the disease is of infectious origin, this colitis may be similarly from secondary infection or it may be of primary importance. On the whole, it is difficult for one studying these cases to avoid the conclusion that the disease dealt with is a primary intestinal infection.

In the search for the etiological factor of this colitis, a thorough examination of the intestinal content is made in all cases where the autopsy can be done shortly after death. At the present a report can be given only of those organisms immediately recognizable. In the twenty-five cases examined, the only organisms recognized constantly are small yeast cells and Blastocystis enterocola. Trichomonas intestinalis was found in fifteen cases and Endameba coli in twelve. The Blastocystis, Trichomonas and Endameba were limited to the large intestine and were most numerous in the cecum. In one case scrapings from the inflamed mucosa of the cecum showed a large number of minute spirochetes within the cytoplasm of the epithelial cells. They were very small and active and practically filled many of the cells. They disappeared shortly on exposure and none was found in stained sections. This observation could never be repeated. Blastocystis enterocola has assumed a position of interest on account of its presence in these autopsies as well as its frequency in feces to be recorded presently. In these autopsies it has occurred in large numbers in the inflamed portions, especially in the cecum, and has been found throughout the large intestine. It has appeared to be particularly active when the ulcer is pres-

ent. A description of the parasite as it occurs with us is in the course of preparation in a separate article. While it is considered as having no pathogenic importance, it appears to be comparable to intestinal parasites such as Endameba or Trichomonas as an indicator of the prevalence of and liability to fecal contamination of the food or drink of an individual or community. Beyond this, the present status of the cell admits of nothing as to its importance.

It is to be noted, then, that from examination of the intestine and its contents after death no known pathogenic organism has been recognized as having any direct relationship to the "pellagrous intestine" in question.

### EXAMINATION OF FECES

In association with this post-mortem study of the intestine and its content, the feces of pellagrins in the Hospital are subjected to thorough study for parasites. Where there is diarrhea the natural passage is taken; where there is none, a saline cathartic is administered. Cold specimens are not examined. Both fresh and stained preparations are examined and where possible a number of times from each patient. This study has revealed the following:

TABLE NO. 1

*Pellagrins, Roper Hospital, Charleston*

| | No. | % |
|---|---|---|
| Total number patients examined | 45 | |
| Patients infected with one or more species, including Blastocystis enterocola | 39 | 86.6 |
| Patients infected with one or more protozoa | 29 | 64.4 |
| Patients infected with two or more species | 22 | 48.8 |
| Patients infected with three species | 8 | 17.7 |
| Patients infcted with: | | |
| Blastocystis enterocola | 25 | 55.5 |
| Endameba coli | 21 | 46.6 |
| Trichomonas intestinalis | 16 | 35.5 |
| Endameba histolytica | 2 | 4.4 |
| Lamblia intestinalis | 1 | 2.2 |
| Blastocystis enterocola and Endameba coli | 13 | 28.8 |
| Blastocystis enterocola and Trichomonas intestinalis | 11 | 24.4 |
| Blastocystis enterocola, Trichomonas intestinalis and Endameba coli | 6 | 13.3 |

As controls for this study the writer has also made similar examinations of the feces from a considerable number of other patients suffering from various ailments, and this has yielded the following information:

TABLE NO. 2

*Non-Pellagrous Controls, Roper Hospital, Charleston*

| | No. | % |
|---|---|---|
| Total number patients examined | 168 | |
| Patients infected with one or more species, including Blastocystis enterocola | 92 | 54.7 |
| Patients infected with one or more protozoa | 72 | 42.8 |
| Patients infected with two or more species | 48 | 28.5 |
| Patients infected with three species | 16 | 9.5 |
| Patients infected with: | | |
| Blastocystis enterocola | 68 | 40.4 |
| Endameba coli | 52 | 30.9 |
| Trichomonas intestinalis | 36 | 21.4 |
| Endameba histolytica | 4 | 2.3 |
| Endameba coli and Blastocystis enterocola | 32 | 19.0 |
| Trichomonas intestinalis and Blastocystis enterocola | 20 | 11.9 |
| Trichomonas intestinalis and Endameba coli | 16 | 9.5 |
| Trichomonas intestinalis, Endameba coli and Blastocystis enterocola | 16 | 9.5 |

From a comparison of these two tables there are two points observed. In the first place, the only definitely pathogenic organism, Endameba histolytica, recognized, was present in only two pellagrins and was also present in four of the control patients. Secondly, a much larger percentage of the pellagrins harbored intestinal parasites and relatively more of them had two and three species than did the controls. It is interesting to compare these results with similar studies in other communities.

Siler and Nichols[1] observed, in 1909, that of ninety-two pellagrins at the Peoria State Hospital, Illinois, 84.8% were infected with intestinal protozoa, that 36.8% of these were Endamebae, "and while no classification of these endamebae was attempted, they were clearly pathogenic in the large majority of these cases, as was evidenced by the symptomatology and by the appearance of the intestines at necropsy." They found, furthermore, that "of 107 non-pellagrous patients, 50.5% were infected with intestinal protozoa, of which 14 % were Endamebae." From their observations at the same place, in 1910, they report that of 50 non-pellagrous patients, 52 % showed Endamebae and 60 % showed flagellates; and of 21 pellagrins, 76% showed flagellates and 76% showed Endamebae. From their observations during the same year at Kankakee and Dunning they report among the patients ("practically all non-pellagrous") at the former place 58 % showing Endamebae

and 77% flagellates, and at the latter place 46 % Endamebae and 32 % flagellates in 62 and 50 patients, respectively.

Ridlon[2] reports that in 95 pellagrins, in Savannah he found 41 infected with Trichomonas, 22 infected with Endameba coli, and 18 with Lamblia intestinalis.

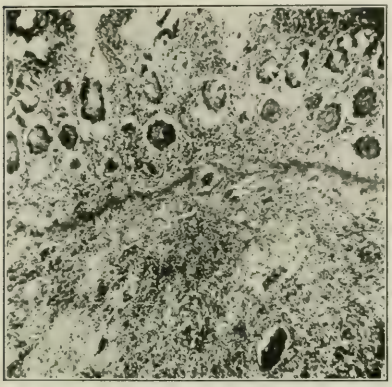

Fig. I.
The colon in acute pellagra. Leitz 6 obj., 10 oc.

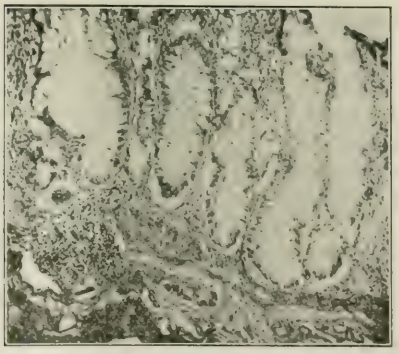

Fig. II.
The colon in chronic pellagra. Leitz 6 obj., 10 oc.

In the aggregate these reports show a high prevalence of intestinal parasites in pellagrins, higher than in the non-pellagrous of the same class. Neither Ridlon nor I found any noteworthy prevalence of pathogenic ameba, and it is to be borne in mind that Siler and Nichols did not classify the Endamebae which they found; and their opinion as to the presence of pathogenic Endamebae is based upon inconclusive evidence. Neither Siler and Nichols nor Ridlon make any mention of Blastocystis.

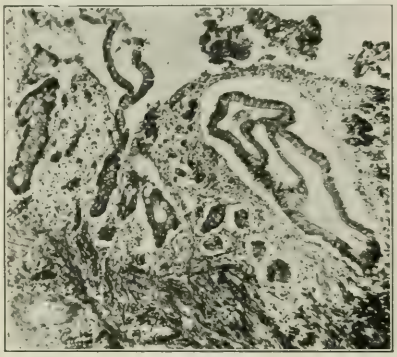

Fig. III.
The colon in subacute pellagra. Leitz 6 obj., 10 oc.

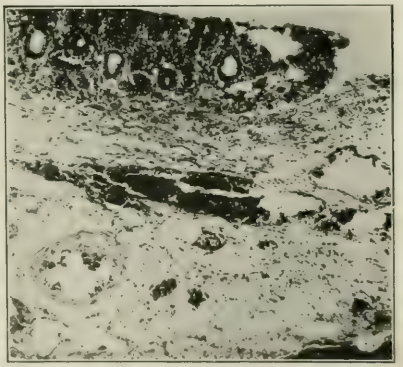

Fig. IV.
Ulcer of the colon in pellagra. Leitz 6 obj., 10 oc.

It is of interest to note that in the Southern communities these intestinal parasites are no more common than in the Northern districts from which these data are obtained.

As a control to the study in Charleston,

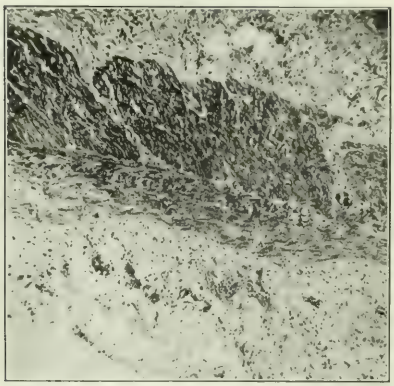

Fig. V.

Outer coats of the colon in pellagra. Leitz 6 obj., 10 oc.

the writer also made similar examinations of the feces of pellagrins in the South Carolina State Hospital for the Insane, at Columbia. Because of the presence there of patients in the active stage of the disease and also of old cases in whom it was quiescent at the time, he found it convenient and instructive to divide them into the two groups.

In the active cases the results are as follows:

TABLE NO. 3

*Active Pellagra, the South Carolina Hospital for Insane, Columbia*

| | No. | % |
|---|---|---|
| Total number of patients examined | 20 | |
| Patients infected with one or more species, including Blastocystis enterocola | 14 | 70.0 |
| Patients infected with one or more protozoa | 11 | 55.5 |
| Patients infected with two or more species | 4 | 20.0 |
| Patients infected with: | | |
| Endameba coli | 9 | 45.0 |
| Blastocystis enterocola | 7 | 35.0 |
| Trichomonas intestinalis | 1 | |
| Lamblia intestinalis | 1 | |
| Endameba coli and Bl. enterocola | 4 | |

In the old quiescent cases the findings are:

TABLE NO. 4

*Old Non-Active Pellagra Cases, South Carolina State Hospital for Insane, Columbia*

| | No. | % |
|---|---|---|
| Total number of patients examined | 27 | |
| Patients infected with one or more species, including Blastocystis enterocola | 5 | 18.5 |
| Patients infected with one or more protozoa | 3 | 11.1 |
| Patients infected with: | | |
| Blastocystis enterocola | 3 | 11.1 |
| Endameba coli | 2 | 7.4 |
| Trichomonas intestinalis | 1 | |
| Endameba coli and Blastocystis enterocola | 1 | |

It will be noted from these two tables that the actively pellagrous keep up the majority of intestinal parasites over those without signs of pellagra, that the general prevalence is less than in Charleston, and that the previously pellagrous have apparently lost their parasites with their symptoms.

This observation offers an explanation of the high prevalence of parasites in the pellagrous in that the intestinal disturbances consequent to pellagra may fertilize the field for the growth and activity of this class of organisms and with the subsidence of the attack the return of the canal to more nearly normal conditions forces a quiescence or disappearance of the parasites.

The difference in environment apparently explains the higher prevalence in the patients in Charleston than in the State Hospital. Practically all of the former were Negroes who had recently entered the Hospital, while the majority of those examined in Columbia were whites who had come from various parts of the State, had been in a well-ordered institution for more or less long periods of time, and consequently had had an opportunity to become rid of these parasites.

From an analysis of this part of the study in conjunction with those of similar nature in other communities it would seem that the high prevalence of intestinal parasites which are communicated by fecal contamination of food and drink in the pellagrous and in the non-pellagrous of the class of people in which pellagra most commonly arises, is an indicator of the frequency with which this class comes in contact with infections which may be transmitted in this manner.

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Editor's Note—This is the second of four papers of a Symposium on Pellagra. The remaining two, with all discussions, will appear in a future issue, probably in May.

## IS THE AVERAGE PHYSICIAN MAKING SATISFACTORY PROGRESS IN THE EARLIER DIAGNOSIS OF PULMONARY TUBERCULOSIS?*

By J. Howell Way, M.D.,
Waynesville, N. C.

The interrogation in the title of this paper may suggest an added inquiry: Is it a confession or a criticism? At the outset the writer prefers to state frankly that it is both. The rank and file of the medical profession have simply followed their leaders,—some at fairly close range; others have lagged more or less rearward, pursuing at times a policy of "watchful waiting."

With the discovery of the bacillus tuberculosis added impetus was given the study of the disease, and in the altered concepts of the pathology of tuberculosis we are forging rapidly ahead in the direction of its better treatment and control. Old theories have been cast aside, new ones taking their places, and yet no man among us is sufficiently wise to foretell the future range of medical science and its possible relations to the enlarged practice of medicine, and the growing practices of promoting by governmental methods the public health.

In private practice, institution work, public health or state medicine, the many-sided phases of the tuberculosis problem ever loom large and ominously. All realize its awful portentiousness and its powerful influence upon the future of civilized man! Agreement is general on certain propositions, notably on its prevalence, causes, infectivity, symptoms, signs, and course, its prevention when possible, as well as on the supreme importance of an earlier recognition of the disease in the private practice of the average physician. Until society arrives at the Utopian era when all human beings will be daily inspected and supervised by competent medical authority relative to their physical and other activities, the practical fact remains that the average general practitioner of medicine is, and will continue to be, the authority on the question of early diagnosing tuberculosis, and the consequent institution of hygienic, therapeutic and prophylactic measures adjusted to the necessities of the individual patient and his environment. Accepting this as the axiomatic principle obtaining, every effort should be made by the leaders of our profession, the medical teaching faculties of the various schools throughout the land, the sundry organizations of our guild, and the sanitary and hygienic machinery of the Federal and state governments, to improve the facilities and to extend the knowledge of the average physician to the vital end that he may excel in his efficiency in the earlier diagnosis of this most dreaded destroyer of civilized man.

Too often, I fear, there is manifested a tendency in many of the contributions to current medical literature, as well as in the numerous excellent monographs from time to time appearing (products of the fertile brains and facile pens of our eminent and other specialists), to assume that it is not expected of the average practicing physician that he shall be able readily to make an early diagnosis of pulmonary tuberculosis. Hence the majority of us possibly have grown to entertain the same mental attitude as regards this important problem, that we have in the past with reference to the early diagnosis of cancer. The so-called "classical symptoms" as commonly taught (and the signs also) of both cancer and tuberculosis have been those not of the earliest periods of the diseases, but rather the secondary symptoms with associated signs, which, translated in the light of modern pathology, indicate rapidly - hastening vital decay of the affected individual and ordina-

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rily presage the announcing of his impending doom.

The surgeons with characteristic vigor have instituted a campaign of education that is rapidly reaching all classes both of physicians and laity, and they are already beginning to reap their material rewards in earlier and increased operative procedures for cancer and cancerous diseases, thereby helping humanity and themselves also. With equal earnestness of purpose, I am satisfied the leaders of internal medicine desire intelligent advances in knowledge which will secure earlier diagnosis in pulmonary tuberculosis, and are willing to urge upon the average practitioner the seriousness of his responsibility and to aid in every possible way a realization of the needed earlier recognition of tuberculosis.

Correlating most critically the case history, symptomatology, and whatever physical signs may be existent in the individual patient, we should be enabled to pronounce at least a presumptive diagnosis with the minimum of developed physical signs and without definitely finding the tubercle bacillus in the sputum. Symptoms in connection with known exposure in early life should enable the average practitioner to make his diagnosis fairly complete, remembering that "Absence of proof is not proof of absence." We dare not wait for the proven presence of the bacillus. Open tuberculosis is rarely or never early tuberculosis, and early tuberculosis all recognize as the type of the disease alike presenting most reasonable hope of arrest and of preventing infection of others. Certainly if public health propositions as related to tuberculosis are really ever to be of much practical utility, case history, symptom diagnosis, with earlier diagnosis, must be popularized with the average physician. Public health propaganda may also afford valued aid in this movement in popularizing the idea that the family physician, if a capable medical man, should be most able to make an early diagnosis of the disease.

In this connection, it may not be amiss to suggest that the continued use (rather abuse) of the term "incipient tuberculosis," as applied to pulmonary tuberculosis in adults, should rapidly become obsolete, it having scant, if any, justification. On casual view, doubtless, this statement may to some appear revolutionary. Yet without doubt, when the profession at large generally appreciates that tuberculosis obtains its initial footing in the immense majority of all cases in infancy or in very early childhood, and when its pathology and the methods by which it is spread are more thoroughly understood, the term "incipient" will be denied the prominent place it has occupied in medical literature. We shall then as a profession generally recognize that true incipiency in pulmonary tuberculosis as demonstrable by manifest lung lesions is not clinically demonstrable by discernible changes in lung tissue.

In infancy or early childhood tubercle bacilli, gaining entrance prior to the building up of the body tissues of specific resistances, may and do find location in almost any and every tissue of the body for the simple reason that at this time there is apparently no selective affinity of tissue for the tubercle bacillus. With this condition we have the incidence of tuberculous lodgment in the brain coverings, in bones, joints, in peritoneum and intestinal nodes as well as in other body tissues. In early life the lymphatic nodes, on account of the antibacillary action of the contained lymph, it is supposed, are prone to restrain the development of the pronounced symptoms of tuberculous disease we see exhibited so often in the familiar forms of chronic tuberculous infections of the superficial cervical nodes in children. Yet even at a very early age such infections of tuberculosis have taken place in possibly the majority of children, cell sensitization occurs, and the partial immunity enjoyed by mankind in general, is produced. Such cell sensitization was proven by Koch's inoculation experiment and accounts for the tuberculous skin reaction, in large degree obtained as a rule in older children and adults.

The time and manner of tuberculous infections becoming clinically demonstrable is one of much interest. In early life bacilli escaping from the lymph nodes undoubtedly do find lodgment in any tissue of the body. It is well known that in maturer years there exists in pulmonary tissue a selective affinity. Whether the lymph stream or the blood current is the source of the metasases does not specifically concern us. The early metastases

may escape observation on account of the bacilli's being few, their virulence's being inhibited by the anti-bacterial elements already formed in the blood, plus the specific resistance set up by sensitized cells. In this way many such infections are healed without clinical recognition, as is evidenced by the known frequency of healed post-mortem tuberculous lesions.

When on account of temporarily lowered tissue resistance from any cause, or in the introduction of excessive numbers of baccilli from without, as happens in prolonged and continuous ingestion in house contact with infective sources, bacilli which have been closed in these primary metastases begin to multiply, secondary metastases and new foci form, toxins are developed and given off with resultant changes in the adjacent body tissues, a degree of collateral inflammation is set up with its consequent necrosis and the clinical features of tuberculosis are in evidence. Thus it is seen that clinically demonstrable tuberculosis has for its pathology far advanced changes in the body tissues. But even here it is well to remember that physical signs of the disease may not be pronounced, or may be so slight as to be overlooked.

Without presuming for one moment to decry or minimize the true value of careful study of the chest sounds in the early recognition of tuberculosis, it is manifest that we shall not make the desired advance in the early recognition of pulmonary tuberculosis until the (at this stage) relatively greater important consideration of the symptoms is more generally appreciated. Careful chest examinations are absolutely indispensable in the diagnosis of general disease states as well as in pulmonary tuberculosis, and their making in the examination of all patients should be desired as a routine procedure on the part of every physician. But I insist that there can be no intelligent hope of the earlier diagnosis of the disease until relatively greater diagnostic value is accorded symptoms. The emphasis properly placed upon chest examinations in all chronic disease, while not to be discounted or revised, for medical men are constantly growing more critically careful, and properly so, has been in large part responsible for this disposition to neglect proper valuations' being placed upon the symptoms.

Unquestionably, given an early history with prolonged contact and definite symptoms of constitutional and focal character, a provisional diagnosis of tuberculosis is justifiable in the writer's opinion in the absence of definite local chest signs. This does not mean that the patient should be frightened with grave suggestions of imminent danger to life, but it does mean that he should be fully advised of his disease probabilities, and his methods of living, occupation, etc., adjusted to conform to hygienic living under intelligent medical supervision.

Frequent and protracted catarrhs of any portion of the respiratory tract, cough persistent from childhood, no matter how trivial the degree, have, as a rule, for their pathological basis a tuberculous origin, and in the absence of known causes existent in the upper air passages, the diagnosis of tuberculosis must in all such cases be given serious consideration. Of late years the prevalence to an unwarranted degree of the phthisophobic craze has seriously militated against the securing of correct clinical data with regard to early house exposures and the frequency with which patients, sometimes ignorantly, sometimes wilfully, deceive us in the early years of life, and equally so with reference to cough, affords an interesting phase of the psychology of such patients.

Much evasion is observed in securing case histories as regards the illnesses of deceased members of their families who were manifestly tuberculous. Ofttimes chronic bronchitis or asthma, especially in the aged, are but coverings of tuberculous foci. Not infrequently patients advise you an X-ray examination has proven an absence of tuberculous lung disease. There are no short cuts to diagnosis in tuberculous disease, especially in securing early diagnosis. One of our chief regrets is that an X-ray picture will not afford a marked degree of diagnostic information in early tuberculosis of the lungs. As an aid to diagnosis, tending to confirm what symptoms and signs have demonstrated already in fairly developed cases of the disease, the Roentgenogram unqualifiedly has a place of value, but I fear there exists a tendency at times to overestimate (especially to the laity) the true value of the X-ray in the early diagnosis of tuberculosis of the lungs. As with the develop-

ment of the modern laboratory, it became quite the fashion too often to accept the laboratory findings as the basis for a diagnosis, with a minimizing of the history and symptoms, so there just now appears to be a disposition in some quarters to pay too great respect to the radiographer to the neglect of the case history and symptoms. As a consequential effect it is feared the diagnostic skill of medical men will suffer if too great dependence is placed upon radiographic or other findings to the avoidance of that intimate degree of personal investigation of the patient himself, so impressive a feature of the equipment of the great clinicians of the past. The X-ray picture is spectacular, appeals strongly to the patient and his friends in presenting something tangible to the eye in the place of information derived largely from analysis and deductions, and unquestionably is a valuable psychic adjunct in the management of patients under observation, particularly for long periods. Again the X-ray avoids (to some extent with some practitioners) the time-consuming and repeated examinations so often a tax upon a busy physician. But I believe it may be insisted that while the X-ray findings are of value in revealing abnormal shadings about the root of the lungs (if normal shadowing here be carefully eliminated) it can be of but very limited assistance in the detection of the early pulmonary lesions in the parenchyma. Unquestionably when dense tuberculous infiltrations have occurred, of course plates will reveal them, but case history, symptoms, signs, readily available for the use of every practitioner, will render the diagnosis positive, anyway, at this period of the disease. But I insist, if possible, the diagnosis should be made prior to the stage of the existence of sufficient tuberculous deposit to show X-ray pictures of diagnostic import, and I also insist it is the duty of the average practitioner to subject every possibly tuberculously infected patient to a routine of critical study with a view to learning to make the earlier diagnosis.

Tuberculin reactions indicate tuberculous infection, not necessarily tuberculous activity. While prompt tuberculin reaction with weak dilutions of tuberculin are of valuable aid in the diagnosis of tuberculosis, and it is more than likely their recognized value will become greater as more general knowledge is obtained and disseminated, and improvements in preparations and methods are shown, it is to be remembered that serious mistakes have been made in the use of such preparations in relying too fully upon their results and in the interpretation of such results. Resulting disastrously at the start years ago, and deterring many from their use, tuberculin preparations and allied products have a distinct field of usefulness in both the diagnosis and treatment of tuberculosis, and the future will unquestionably afford us even more helpful resource along this line of endeavor. In this connection I may not fail to mention the exhaustive studies of the Drs. Von Ruck, of Asheville, N. C., relating to the use of vaccines in the early recognition of tuberculosis and its therapy as well. A careful survey of their work should become a part of the equipment of every practitioner who wishes to do all possible to earlier diagnose and treat tuberculosis.

A most frequent error is perpetrated in assuming a cause for suggestive symptoms without scrutinizing examinations. The symptoms produced by the toxemia of tuberculosis are to an extent common to other toxic influences. Of course there must be symptoms of a focal character to make the clinical picture suggestive. Even in the presence of a run-down condition, whatever this really be, anemia, dyspepsia and similar diagnoses (or better, shifts for diagnoses) are too often applied to explain the symptoms at a time when more extended study of the patient's symptoms would result in finding possibly corroborative signs and in making a diagnosis of tuberculosis.

Tuberculous activity, it is to be remembered, frequently subsides without treatment, often under treatment, and also despite treatment. With a full consciousness of its universal prevalence the average doctor does well who keeps ever in mind the possibility of his patient's having the disease if his symptoms do not readily place the bar sinister on such diagnosis. There is possibly no disease in the category of medicine where success in treatment demands earlier and more accurate recognition of the disease. And yet today pulmonary tuberculosis is diagnosed, in the main, and its existence ad-

mitted, only when the tissue destructive processes have advanced so far that bacilli are in evidence in the sputum. The modern surgeon would indeed be reprehensible did he wait for incontestable proof of the existence of an acute abdominal inflammatory condition demanding surgical treatment before operating upon his patient. We carry our responsibilities too lightly when we await the signs of advanced disease, meanwhile overlooking the ominous symptomatology which if only carefully considered by being sought for would be found to precede the physical signs in large part. If we are to choose a policy of "watchful waiting," let it be truly watchful waiting and correlating the evidence, thus affording the patient the full benefits of a recognition of existing disease conditions in time to be of most service to him.

### CONCLUSIONS

We should keep constantly in mind that tuberculosis is the most frequent of diseases, and when we have persons coming to consult us with indications of debilitated systemic states and slight cough we should not consider our duty performed to them until a most painstaking case history and study of their symptoms have been made, making several examinations and a complete temperature record for several days.

Of vital importance always is a carefully-taken history.

Tuberculosis is the most frequent cause of cough.

Physical signs found on one side of the chest differing from those on the opposite side should almost necessarily, unless positively indicative of some other known condition, indicate tuberculosis.

The tuberculosis problem in its most vital part rests upon the average doctor who, if he only realize it, is quite capable with brain, eyes and ears of making the diagnosis of early tuberculosis, and this duty should not be assumed to be the peculiar function of specialists.

## CARDIAC EFFICIENCY IN RELATION TO CARDIO-VASCULAR-RENAL DISEASE*

By James S. McLester, A.B., M.D.,
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The question of cardiac efficiency is in reality one of myocardial integrity. Valvular injuries are of secondary importance and are entitled to consideration merely as a source of embarrassment to the myocardium or as pointing to its involvement in some pathological process.

For a proper appreciation of the mutual dependence of heart and arteries one must keep before him the embryology of the vascular system. The embryonic human heart develops from the primitive cardiac tube, which in certain of the lower vertebrates appears as a sort of pulsating artery, the posterior end of this tube being continuous with the great veins and the anterior end becoming the aorta. The heart thus viewed is nothing more nor less than a highly differentiated blood vessel, and it can readily be understood that disease processes which involve the arteries are sure also to attack the walls of the heart. We find always myocardial disease and atherosclerosis progressing hand in hand. It should be remembered in arterial hypertension that it is not alone the increased work demanded of the heart which leads to hypertrophy, since the same influences which cause arterial disease produce also degenerative changes in the myocardium.

The relation of cardiac efficiency to kidney disease is apparent, for in last analysis what we call cardio-vascular-renal disease could, according to our present conception of its pathology, be more simply termed arteriolar disease, and, as has just been said, arterial disease and heart disease are inseparable. And, too, the cardiopath eventually becomes a nephritic, while the fate of the patient with chronic nephritis depends at last upon the efficiency of his myocardium.

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Having said this, it remains only to discuss the heart muscle and the best methods of estimating its functional capacity. Disturbance of any one of the fundamental properties inherent in cardiac muscle, — contractility, excitability, ability to initiate impulses, conductivity and tone,—will lead to disordered function and inefficiency, and this at times without gross histologic evidence.

The heart muscle possesses wonderful reserve power. It easily meets increased demands with increased work and not until definitely injured does it become incompetent. The muscle fibre which in contracting performs a certain amount of work will, on being stretched, exhibit a still greater degree of energy in its subsequent contraction. This explains why dilatation of the left ventricle permits the heart which is handicapped by disease to exert greatly increased propulsive force and thus maintain the normal circulation of blood. Such stretching of the individual fibres, with, to a less extent, formation of new muscle, enables the myocardium for a time to meet efficiently increased demands; but this is not an indefinite process and this stretching finally reaches a point where the power of contraction, instead of increasing, becomes seriously damaged or is lost. When this occurs, both reserve and rest force have been lost and incompetency begins.

There seems to be good reason, too, for believing that the dilated and hypertrophied myocardium is peculiarly susceptible of disease, and that degenerative and other changes easily take place. And if in the beginning the myocardium has been extensively damaged, then cardiac efficiency is impaired all the earlier.

Anything which disturbs the sino-auricular node, the so-called pacemaker, or so increases the irritability of other cardiac areas as to lead to ectopic beats, will in time seriously interfere with the work of the heart. In like manner, influences which lower or abolish conductivity, particularly of the bundle of His, give rise to abnormal and inefficient contractions.

Such disturbances produce the greatest disorders of rate and rhythm. When stretching of the left auricle is greatest the peculiar condition known as auricular fibrillation sets in. In fibrillation all of the fibres (or bundles of fibres) contract independently, each with a rhythm of its own, and as a result the auricle remains in a sort of quivering state of diastole and accomplishes no work. The bundle of His, instead of receiving from the auricle its rhythmical impulses, is bombarded by these thousands of impulses from the fibrillating muscle, only a very few of which are permitted passage, and this in an irregular manner, so that the ventricular systoles become wildly irregular and the whole mechanism is inefficient.

In estimating the functional capacity of the heart, venous tracings and the electrocardiogram are of value in facilitating diagnosis, for a clear understanding of the electrical changes arising in the diseased muscle will give a fair idea of its capabilities both for the present and for the future. Knowledge of the origin of certain disturbances of rate and rhythm is important in prognosis, and such knowledge can frequently be had only by means of the electro-cardiogram, and yet it should not be forgotten that instruments of precision have very definite limitations. They appeal to the imagination and accurate data such as they offer are attractive, but such data can never replace or even compare in value with the information gained through painstaking clinical observation.

Impairment of cardiac efficiency is, as a rule, advanced long before attention is ordinarily directed to the heart. The weakening myocardium presents certain early signs which, though frequently disregarded, should, like the signs of incipient tuberculosis, be taken as a warning of trouble ahead. Lassitude, an indefinite sense of discomfort or oppression in the chest and throat, a consciousness of irregular, rapid or violent heart action, insomnia, incapacity for sustained mental effort, forgetfulness, slight giddiness, are all subjective signs which point to exhaustion of the heart's reserve force. It is probable that most patients with failure of compensation have earlier experienced these prodromal symptoms, the prompt appreciation of which could have led to the easy restoration of circulatory equilibrium. In considering cardiac efficiency these early subjective signs are entitled always to first place, since obviously it is infinitely better to avert the destruction of the heart's efficiency than later to attempt its restoration.

The size of the heart forms an indefinite but still an excellent guide to its ability to do its work, for the compensation which is preserved by great hypertrophy approaches the breaking point. The means of estimating such hypertrophy depend somewhat upon the skill and experience, as well as the bias, of the observer. The location of the apex beat and the area of cardiac dullness as determined by percussion and palpation are, when controlled by more precise data, seen to be rather unreliable guides. The exact size of the heart in each of its dimensions can be determined accurately by the Roentgen ray, either through orthodiograms or teleo-Roentgenograms. This latter method in which the heart is Roentgenographed at a distance of six feet or more, thus obtaining practically parallel rays and an image the exact size of the heart, has largely superseded the former.

Little has been said about the contour of the heart as expressing its degree of hypertrophy. To me the shape of the heart, its physiognomy so to speak, as shown by the ordinary Roentgenogram, or as seen in the fluoroscope, offers just as valuable evidence as do its measurements expressed in centimeters. The great blunt, rounded apex and the bulging right border tell just as surely of the burden under which the heart is laboring as do these figures and, in slight degrees of hypertrophy, better.

The manner in which the heart responds to exercise is after all the best measure of its efficiency. Subject a patient with an impaired myocardium to violent exercise and the heart dilates—usually to an appreciable degree—while the normal organ under similar exercise will remain the same size or even for a time become smaller. Comparative measurements by means of teleo-Roentgenograms, taken before and after certain standard exercises, have been offered as a reliable measure of cardiac efficiency. Here again the teleo-Roentgenogram is not essential for purposes of comparison, since ordinary Roentgenograms are eminently suitable, provided the factors of focus, tube distance, etc., are the same in both exposures. A certain error exists, but it is a constant one and does not influence the comparison. I can testify to the convenience and accuracy of such cardiac measurements.

The second aortic sound in the normal individual becomes louder after exercise, being distinctly louder than the second pulmonic. When the left ventricle, however, weakens and dilates on exercise, the second aortic sound becomes weaker than the pulmonic. This indicates impending failure of the left ventricle, and when after exercise both second aortic and second pulmonic sounds become weaker the entire cardiac mechanism has failed.

Many attempts have been made to devise a standard of exercises by which the heart could be tested. Changes in rate and rhythm and the patient's degree of exhaustion after such exercise have been taken as a measure of cardiac efficiency. Barringer, in his studies of this subject, has made a very interesting and perhaps valuable observation. Using various forms of exercise, including dumb bells, a steel bar, and the ergometer, he found that in the normal individual both blood pressure and pulse rate rise during exercise to fall immediately thereafter, but that excessively severe exercise, such as completely exhausts the heart, was followed by a distinct delay in the rise of systolic pressure. Continuing these observations upon the individual with an impaired myocardium, it was seen that during even ordinary exercise the expected rise failed to take place, and that immediately thereafter a delayed rise in pressure appeared. This delayed rise, then, is simply evidence of an overtaxed heart and the amount of exercise necessary to produce it, as expressed by Barringer in foot pounds, is taken as the measure of cardiac efficiency.

And finally but most important, in this as in other realms of medicine, there is no short cut to diagnosis, no one simple rule by which we can measure all cases. The field of cardiac response, as Mackenzie calls it, is the same in no two individuals. Limits which are normal to one may in another with a different physique and other habits of life suggest serious encroachment. Many and various factors must be considered, and sometimes prolonged scrutiny is necessary before we can clearly judge the heart's ability to do the work required of it. Intelligent, painstaking clinical observation, the way the patient lags or goes forward with his daily duties, his reaction to ordinary activities, his manner of meeting the exi-

gencies of life, his general sense of well being—these and many other signs give us after all the best measure of cardiac efficiency.

Editor's Note—This is the sixth paper of a Symposium on Cardio-Vascular-Renal Disease. The first one appeared in January, the second and third in February, the fourth and fifth in March, and two are in this issue. The one remaining, together with all the discussions, will appear in May.

## PROGNOSIS IN CARDIO-VASCULAR-RENAL DISEASE*

By George Dock, M.D.,
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Many have an idea that prognosis is a sort of useless ornament attached to the name of a disease or a symptom. It is in fact an outgrowth of the diagnosis. The diagnosis includes not only the name of the disease, but the most accurate idea possible of the anatomic and functional condition of the whole body. From this and from the known or probable etiologic conditions, the prognosis reveals itself, that is, the various possibilities that can be expected, and, being foreseen, they can be better met. Prognosis being the response to a natural demand of the human mind,—the demand that perpetuates fortune tellers,—is very old; but in its most valuable form is never in advance of diagnosis, is closely dependent upon the latter, and must keep in close touch with its progress. On the whole, the value of a prognosis will depend upon the exact recognition of the anatomic and functional condition of the subject, and the accurate realization of all the data accumulated in literature bearing upon the problems involved. Every prognosis, then, like every therapeusis, has two aspects,—one general and one specific or individual.

Like all other parts of medicine, prognosis is surrounded by certain traditional errors. Sometimes it seems as if the errors are greater in cardio-renal disease than in some other kinds of disease. In view of the rapid advances in knowledge this should soon change. Certainly among the so-called intelligent public there is still an exaggerated idea of the danger of sudden death, and an undue pessimism as to improvement, often spoken of as curability, of these diseases. Every sudden death among acquaintances, every published case of death from heart or renal disease, sends a number of people to physicians, impelled by the fear of a similar end.

Though the situation is not the same in the profession, it is a fact that many physicians share this belief. Mackenzie is quite right in saying that "gross injustice has been done to individuals, not only in the pecuniary aspect, but in having imposed upon them great expense, unnecessary treatment, and mental disquiet, because the meaning and prognostic significance of some simple symptoms, as a murmur or an extra-systole, have not hitherto been recognized." And he further says: "That auscultation is not an unalloyed blessing is too painfully evident, for not only have totally incorrect conclusions been drawn as to the bearing of murmurs on the future of the patient, but so much time has been spent in investigating the physics of their production, that more important matters have been lost sight of. It is so easy to recognize a murmur that other less obvious but more significant signs have been too often neglected."

I believe another easy diagnostic method—blood pressure determination—is being misapplied in prognosis, and, like murmurs, in both directions, — exaggerating fear when high, causing undue confidence when low. The following example shows how in one important phase of prognosis —life insurance — the pseudo-mathematical accuracy of the sphygmomanometer exerts an undue influence, as it also shows how the murmur has lost some of its terrors in the same field. A man of 50 with mitral systolic murmur, high blood pressure both systolic and diastolic, hypertrophy of the ventricles, and one attack of incompensation relieved by treatment, applied to a standard company for a $50,000 policy, which he could easily afford to take. On examination he was told his blood pressure was too high, being 155, and that he could not get the policy if his pressure were over 139. He knew something of the pharmacology of nitroglycerin, took it for a few days, applied for another examination, a cuff was put on his arm, 139 mm. reported and a policy issued at the normal rate.

No doubt a similar laxity occurs in the management of some cases, but it is more

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common to see an unduly bad prognosis given, with corresponding advice. In many cases like the one just cited, on the first examination the patient is told he has heart disease, advised to stop all physical and mental work, and told to rest, sometimes very uncomfortably in bed, for weeks at a time, with more or less digitalis. It is pleasant to note that the shotgun prescriptions of digitalis, strophanthus and nitroglycerin of a few years ago, also the passion flower, lily of the valley, etc., of the same period are rarely used. The task of the consultant in such cases is disagreeable, but most important.

In another class of cases a similar mistake is often made—in children with acute or chronic tonsillitis, with heart murmurs. Here prohibition of school, and of all exercise is prescribed, and often much needed operations upon tonsils and adenoids are warned against on the ground of heart disease. The careful practitioner in such cases will, of course, realize the possibility of an acute or subacute endocarditis, and endeavor to make an exact diagnosis as early as possible, but the great majority of such cases, with comparatively simple management, pass on to complete cardiac function.

In kidney diseases, notwithstanding Osler's paper on the advantage of a small amount of albumin in the urine, both albumin and casts are far too often looked upon as signs of hopeless renal lesions.

It is not a little curious that these conditions exist, for it is difficult to find the explanation. An examination of the textbooks of the last quarter centry reveals no warrant. So far as the heart is concerned, one must go as far back as Corvisart,—considerably over a century,—to find any basis. Among the great heart students after Corvisart,—Bouillaud, Aran, Walshe and Bamberger, — the views are much more optimistic than current practice would indicate. Stokes, whose views are so often strikingly modern, is not only sound on the main features, but goes into admirable detail. So he says that sudden death in heart disease is by no means so frequent as is generally supposed: "In the greater proportion of cases sufficient notice is given by long-continued symptoms of dropsy and of pulmonary and hepatic disease." He pointed out the harm of a bad prognosis, and the value of hope and cheerfulness, and he emphasized the advantages of a careful study of the heart muscle, its mode of action, its irregularities, as also of the condition of the other organs.

Very recently the lamented Elsner, in Barker's "Monographic Medicine," has admirably detailed the minutiae of prognosis, and with access to that it is unnecessary to set forth details in discussing the subject.

A few points that have impressed themselves upon me, however, may be stated. One is that a bad prognosis should not be given at the first examination unless the evidences of heart failure are well marked, or unless there is advanced arteriosclerosis, strong suspicion of coronary artery disease, evidence of severe renal insufficiency or other dangerous organic disease. Even then, the bad prognosis should be tempered by a statement as to the chance that rest and appropriate treatment may modify the outlook. In such cases the 'phthalein test has shown itself a valuable prognostic guide when low, in the absence of other renal signs.

In children below the age of puberty no far-reaching, briefly-worded prognosis should be given, but the danger of the period of development, and the need of constant supervision through that period must be made clear.

In adults with definite lesions the whole mode of life must be regulated, and the patient made to understand the genuine value of accurate management, in which medication plays a small part.

When loss of compensation occurs, the prognosis can be greatly aided by the careful observation of the effect of treatment, and the degree of functional power regained.

No matter how complete the incompensation, a hopeless prognosis for improvement in a given attack should not be made, for patients not rarely seem to be *in extremis* and then recover to a surprising degree and remain so for months.

All the advances disclosed by investigation as to diagnosis should be applied to given cases, and their usefulness in prognosis worked out, while the treatment should follow the most advanced knowledge.

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# TUBERCULOSIS, A DISEASE OF CHILDREN*

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The importance of tuberculosis in early life is one of the subjects which has received especial consideration in latter years. That it makes up no small part of the mortality during childhood is shown by the autopsy findings in practically all medical centers. Still reports tuberculous lesions in 269 out of 969 consecutive autopsies in the Ormond Street Children's Hospital, and states that in 223 of these tuberculosis was the immediate cause of death.[1] While in New York, in a series of 1320 autopsies in children, all under five years of age, 13.5 % showed more or less generalized tuberculous disease.[2] The mortality among private patients is certainly much less than this, but there is no doubt that many deaths from the acute type, which characterizes tuberculosis in nurselings, are attributed to other causes.

However, it is tuberculous infection rather than tuberculous disease which adds greatly to the importance of the first decade of life. Von Behring originally advanced the view that all primary tuberculous infection occurred before puberty, and the newer tuberculin tests have enabled us to ascertain, with a reasonable degree of accuracy, the number of latent cases and to recognize some of the obscure manifestations of the disease.

Assuming that a positive cutaneous test is evidence of hypersensibility brought about by the presence of tubercle bacilli in the body tissues, and comparing the results of these tests with autopsy reports and similar tests in adults, we are impressed with the fact that the per cent. of positive reactions at puberty is practically the same as at any later period of life.

The largest series of reports come from Europe, where the number of positive reactions is considerably higher than in this country. But the opinion of American investigators bears out the conclusion, that, making due allowance for difference in home hygiene and better living conditions, there is the same relative proportion of infected children and tuberculous adults here as in Europe.

Dr. G. R. Pisek, of New York, gives as his opinion that 60 % of all infections occur before the sixth year, and 70 % before the fourteenth year.[3] Dr. Alfred Hess, of New York, thinks that over 70 % of the infections occur before the third year; and Prof. Hamburger, of Vienna, states that 51 % are infected during the first year of life, and 94 % by the end of the fourteenth, while results of autopsies in supposedly non-tuberculous adults show that from 69 to 92 % have evidence of tuberculous disease somewhere in the body.[4]

For many years tuberculosis was believed to be hereditary. This view was held by the layman and profession alike; and, while we now know that only occasionally is a child actually born tuberculous, the clinical facts are the same today as during the last generation—that is, that tuberculosis is a family disease, and the large majority of intelligent tuberculous patients can give a history of definite exposure to other cases in the household during their own childhood.

The relation of children to tuberculous cases in the family is necessarily intimate; and it naturally follows that the greatest factor in the infection of children is the presence of active disease in either parents or grandparents. If to this be added a crowded and poorly ventilated home and food of insufficient quality or quantity, there is practically no chance for the child to escape.

Prof. John Howland, of Baltimore, Drs. Holt, Biggs and Chaplin, of New York, and Lucas, of San Francisco, believe that 90 % of the infections in childhood are the result of close personal contact with tuberculous individuals;[5] and this seems to represent the majority opinion of the profession today.

The effect of good home conditions on the percentage of childhood infections is shown by Cattermole in a small series of tests among private patients in Colorado, where, with over half of the patients suffering from active tuberculous disease, only 38 % of the exposed children and less than 1 % of the unexposed gave positive tuberculin reactions.[6]

*Read in Section on Medicine, Symposium on Pediatrics, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

Fishburg gives us the reverse of this picture from the tenement district of New York, where he found that 67 % of the children living with tuberculous parents and over 52 % of those with non-tuberculous parents gave positive reactions.[7] This would indicate not only a widespread prevalence of virulent bacilli in the tenement homes, but also a low resistance of tenement children; and the conclusion is justifiable that few of them reach puberty without infection.

In this connection it might be of interest to quote the figures of Knopf, who states that 82 % of the cases of tuberculosis in Berlin occur in families occupying two rooms or less and only 6 % in families occupying four rooms or more.[8]

Aside from the part undernourishment plays in increasing the general susceptibility to disease, food is a direct etiological factor, but just how much importance bovine tuberculosis may have in the production of the disease is still a mooted question. The British and German Commission found the bovine type in 13 % of the cases in children,[9] and Park and Krumwilde, from data obtained in fifteen hundred of their own and collected cases, conclude that over 10 % of the tuberculous disease in children under five is of bovine origin.[10]

The report of the United States Bureau of Animal Industry, that between 20 and 30 % of the dairy cattle of this country are tuberculosis, would indicate that there is opportunity for a widespread infection from this source. That such does not occur must be attributed to the fact that it is only when there is disease of the udder or active ulceration of the intestinal or genito-urinary tract that the purity of the milk is endangered.

The bovine bacillus seldom remains latent in the human, and adults seem practically immune to it. In the child the most common clinical manifestations of bovine infection are the cases of so-called surgical tuberculosis, viz: cervical lymphadenitis and diseases of the bones, joints and abdomen.

The location of the earliest lesions of tuberculosis, when such lesions can be demonstrated, would naturally depend very largely upon the route of infection, that is, whether the disease is acquired through the respiratory or alimentary tract. Wollstein and Bartlett report that in 178 children under five years of age, in which the initial lesion could be ascertained with reasonable certainty, 135 showed the earliest signs of disease in the thorax.[11] All statistics go to prove that early and marked envolvement of the tracheo-bronchial and, to a less extent, the mesenteric lymph glands, is the rule. And here, no doubt, is the site of the latent disease, which only awaits a more favorable local or constitutional condition to again become active.

In a brief discussion of this kind it is manifestly impossible to more than outline the more common types of the disease peculiar to childhood, and to call attention to the most common symptoms and diagnostic points.

The symptomatology and course varies widely. In older children the symptoms differ little from those seen in the adult; but in nurslings the disease shows a marked tendency to early generalization and progresses rapidly to a fatal termination. The prognosis during the first year is absolutely bad, and during the second year a large per cent. of the cases end with meningitis.

The clinical types to be especially noted are generalized tuberculosis, and disease of the thoracic glands, of the lungs and of the abdomen.

In the diagnosis of tuberculosis of any form the cutaneous test is of value. In infancy a positive reaction undoubtedly means active disease; for latent conditions do not exist before the third year. In older children a positive reaction aids in confirming a suspicion of tuberculosis when there are definite clinical symptoms and physical signs; and repeatedly negative reactions will serve to eliminate tuberculous disease from further consideration in the diagnosis.

Another symptom of value, and one which is frequently overlooked, is the presence, in a considerable per cent. of cases, of certain characteristic skin lesions. The tuberculides are not difficult of recognition and are often the earliest definite evidence of tuberculosis. The more common clinical types are lichen scrofulorosum, scrofuloderma, erythema induratum and the pap-

ulo-necrotic and papulo-squamous forms. These lesions may be isolated and few in number, but their morphology and sites of predelection should be kept continually in mind in all routine examinations.

A history of exposure to open tuberculosis in other members of the family is of the greatest diagnostic importance, and particularly if the child is under five years of age and the exposure has lasted over a considerable period of time.

General tuberculosis is often insidious in its onset, and in nurslings the symptoms are frequently those of a general wasting. As a rule a carefully kept temperature record will show the presence of elevated temperature, although this is seldom constant or regular in its course. It should serve, however, to raise the suspicion of tuberculosis, because marasmus, as a result of chronic alimentary disease, runs a subnormal temperature.

Late in the disease there may be recognized more or les definite signs in the lungs or outspoken tuberculosis elsewhere. But frequently the development of meningitis is the first suspicious symptom.

It is in these cases that the tuberculin test and frequent search for the skin lesions may prove most helpful.

In other instances the clinical picture is more nearly that of an acute infection, with a sudden onset and a rapid rise of temperature. There may be the physical signs of a bronchitis, but the general appearance of a toxic pneumonia.

Tuberculous disease of the lung may be divided into two groups—first, chronic pulmonary tuberculosis, which differs little from the phthisis of adults, except that the disease spreads from the deep-seated bronchial or pulmonary glands and the earliest lesions are frequently in the base or near the root of the lung; and secondly, acute tuberculous broncho-pneumonia, which is by far the most common and characteristic clinical type of tuberculosis in early life.

Two symptoms of pulmonary tuberculosis in the adult are of no diagnostic value in children, viz: sweating and hemoptysis. Children sweat easily from any cause, and rickets, debility from acute illness, or severe anemia, may be ample explanation of profuse night sweats.

Hemoptysis is a rare complication of tuberculosis in children. It is much more likely to occur as a complication of whooping cough or pulmonary congestion with advanced heart disease.

Cough is a more or less constant symptom, but is present in too many other conditions to be of much diagnostic value. Holt calls attention to the possibility of sputa examination even in very young children and states that bacilli were found in 80 % of his cases. His method of collecting sputa is to incite a cough by irritating the pharynx with a cotton or gauze swab, to which the sputa will adhere.

In tuberculous broncho-pneumonia the symptoms and physical signs do not differ from a simple broncho-pneumonia, and delayed resolution is often the first thing which raises a suspicion of tuberculosis.

In the less acute cases paravertebral dullness and changes in the breath sounds in the inter-scapular region are suggestive of tuberculous disease. And if these be associated with elevated temperature, rales and a positive Von Pirquet we may feel reasonably sure of the diagnosis.

We have already noted that disease of the bronchial lymph glands is the most frequent manifestation of tuberculosis in children. This, however, is from the pathological view-point. Clinically, such lesions may exist without symptoms or only be suspected when secondary infection occurs. When, however, there is pressure upon some bronchus or irritation of the vagus or phrenic nerve, cough and dyspnea are apt to develop. These constitute the most characteristic symptoms. The cough is dry, sometimes croupy, and often paroxysmal, resembling pertussis. The dyspnea is most marked on expiration and is frequently intermittent.

Enlargement of the superficial veins over the upper throax may be noted and is especially significant if unilateral. Examination usually shows relative dullness on one or the other side of the sternum at the level of the third or fourth rib or in the inter-scapular space. The most constant sign is vertebral bronchophony at a lower level than is seen in health, extending in some cases as far down as the sixth thoracic vertebra (D'Espines' sign).

The course of disease of the thoracic glands is variable. Encapsulation or calcification may occur, or the glands may go on to caseation and ulcerate into a bron-

chus, setting up an acute process in the lungs, or again extension through the lymph channels or blood vessels may set up an acute generalized tuberculosis. The disease focus may remain latent for an indefinite period until some intercurrent illness lowers the general or local resistance and lights up the infection. Owing to the bronchial catarrh accompanying them, measles, whooping cough and influenza are the most frequent sources of trouble.

Abdominal tuberculosis, when the result of bovine infection, is usually primary, but it may be and often does occur as a secondary condition to thoracic disease. It may be a part of general miliary tuberculosis, in which case the onset is sudden and the symptoms are those of an acute general peritonitis. When, however, the peritoneum becomes infected from the mesenteric glands, the onset is more gradual and the course is distinctly chronic. There is always marked emaciation and usually a decided afternoon elevation of temperature. There may be free fluid in the peritoneal cavity, but the plastic type is perhaps the more common clinical variety. In this type there develops the "doughy" feeling to the whole abdomen and the characteristic swelling and inflammation at the umbilicus. The differential diagnosis depends upon the history of exposure, the course of the disease and the result of the tuberculin test.

The isolation of all cases of tuberculosis and the destruction of all infective bacilli may be a "consummation devoutly to be wished for," but it is manifestly impossible.

If the first decade of life is the period of the greatest susceptibility to infection, and such seems to be undoubtedly the general belief, prophylaxis of tuberculosis in childhood becomes the most worthwhile proposition that confronts the medical profession. It simplifies the whole question of prevention, and concentrates our effort along more or less definite lines. As a matter of fact, in the general campaign against tuberculosis the child is given only passing consideration.

The first requisite for the proper institution of preventive measures is a complete census of the tuberculous cases and the enforcement of a law requiring all new cases to be reported. In connection with these reports there should be data as to the home conditions of the patients, number of rooms available for occupancy, number of individuals in the family, and especially the number and ages of the children. This data should be arranged on a unit basis. With such an arrangement, one district nurse to each unit, could make the rounds often enough to keep in touch with the conditions of each family, and combine, to a certain extent, the duties of a visiting tuberculosis nurse and child welfare worker.

The cost to each unit would not exceed the average tax now paid for the control and punishment of petty criminals, and while we will admit the undesirable character of chicken thieves and "crap-shooters," their total elimination is of small importance as compared with the prevention of even a part of our tuberculous mortality.

The points to be stressed are ample protection for all children under five, and prevention of the massive infection, which is sure to occur when there is active disease in either parent or some other member of the household. No mother with active disease should nurse her infant, and she and others of the household should be taught by precept and example all the detailed precautions necessary.

In a certain per cent. of the families, where ignorance and poverty or a bedridden mother makes home conditions hopeless, there is nothing to be considered except the removal of the younger children to a "preventorium," the establishment of which is one of the first problems that confronts us.

The second and less important requirement in preventing infection is the control of bovine tuberculosis. This can be done only by uniform state laws or, better still, by the Federal government. At present the Federal law prohibits the interstate shipment of tick-infected cattle into tick-free territory, but places no restrictions upon the movement of tuberculous cows; and each state has individual and widely differing regulations.

In addition to the measures to minimize the dangers of infection *per se*, there are others which will improve the general physical well-being and increase the tissue resistance against active disease. These measures are applicable especially during

school age and demand, in addition to uniform school inspection, a school medical advisor. In fact, the physical fitness of the school child is of the greatest importance from every standpoint and should receive as much consideration as his mental training. Every child who is anemic, under weight, scrofulous or otherwise below par, should be given the advantage of open air schools and should receive the especial care of the medical advisor.

In my own state there has been recently instituted work along this line. Beginning, in 1914, with two nurses for the whole state, the number has been increased to thirteen, twelve of whom are assigned to definite districts. Previous to the institution of this plan there were practically no cases reported to the board of health. During the first year of the present campaign 1225 cases were seen by the visiting nurses and up till September of this year 2781 patients are or have been visited and instructed in the principles of prevention. The average time between visits is four weeks, and the nurses report that the great majority of the families visited are interested and really endeavor to follow instructions.

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DISCUSSION

*Dr. L. W. Elias, Asheville, N. C.*—When we remember the pitiful way tuberculosis spreads among children in the family of a tuberculous father or mother; when we remember that practically all tuberculosis is contracted in infancy and early childhood, we see the importance of this subject and how widespread tuberculous infection is throughout the country. When we know it is contracted in early childhood we have before us a subject that is worthy of our best consideration.

I can add very little to the subject, but I would like to emphasize a few points, one of which is the difference between the disease in babies and in older children. In older children the type of the disease is similar to that in adults. In babies we find frequently very healthy looking children, rosy, fat, and sometimes they gain in weight, and we are often misled by their appearance. We must remember that, unlike syphilis, where a child comes into the world already infected with it, we have a baby that comes into the world perfectly healthy and is then attacked by this disease, so that we must not be misled by that point. When we consider the history of the case and the careful examination of the case, there are two main points I wish to stress, one of which was mentioned by the essayist. These are the Von Pirquet skin test and the X-ray. I do not think he mentioned the use of the X-ray. If the skin test is positive in the first three years of life, regardless of the other symptoms or lack of symptoms and the general condition of the child, we find the disease early and treat it just as actively as if the child were a frank case of tuberculosis with all the symptoms of active tuberculosis. Only by doing this do we save these little fellows. If we wait until active symptoms develop, we will have begun too late. If we find a case that does not show and act as though it had the disease, if the Von Pirquet skin test in the first three years is positive, it means active tuberculosis.

The X-ray is valuable in diagnosis, yet there is one point to add to that. Not only should an X-ray examination be made, but the X-ray findings should be interpreted by a man who understands the findings. The average practitioner may not be able to see anything or make anything out of the X-ray that he can show to the expert in tuberculosis.

Just one word about hemoptysis in early childhood, which is rare. I had one case in which the Von Pirquet skin test was negative at four years of age. The child was syphilitic. Examination was negative. Two years later the child had had a hemorrhage from the lung, so the doctor said. I was inclined to doubt it on account of the rarity of the disease. The child up to that time had an absolutely negative Von Pirquet, but now it had an active Von Pirquet skin test and it was put under proper treatment. The treatment should be the same as for the adult, namely, hygienic treatment, tuberculin treatment. There is just one thing I would emphasize in treatment and that is we should put the baby out of doors. The parents are inclined to coddle the baby and wrap it up and not give it fresh air. It is of the same value, if not more, to the child than it is to the adult. In the South we can keep the child out of doors all the year round. You will find generally that the appetite is improved by fresh air, and the child will gain in weight when it would otherwise not do so, particularly if kept in a room with the windows wide open. Furthermore, if these children are allowed to sleep on the porch, they grow fat and rosy.

*Dr. Thompson Frazer, Asheville, N. C.*—As the essayist has very well said, tuberculosis in children is largely tuberculosis of the bronchial glands. He has shown us that it is difficult in many cases to distinguish what we call tuberculous disease from tuberculous infection. We know that of the children who are infected, a great majority will not develop glandular tuberculosis; in fact we may find all the signs of bronchial gland tuberculosis, and yet we can not say that the child has tuberculosis in a clinical sense. So that I think besides the

physical signs we must pay attention to the history. By the history, I do not simply mean a history of exposure to infection, although it may have been recent, but we should get a history of the onset of the disease. So frequently in childhood we find our attention is called to a possible tuberculosis following some acute disease, notably influenza, measles, or whooping cough. The cough persists, and the child, instead of making a normal convalescence, does not gain in strength or weight. Some writers have pointed out the importance of systematically weighing the child because a normal child should gain regularly. If we find symptoms, we can then pay more attention to the physical signs in the chest, but the physical signs which we find indicative of bronchial gland enlargement do not mean tuberculosis by any means. We can have other causes which produce these signs.

The essayist spoke of enlargement of the veins of the chest, of enlargement of the lymph nodes, and there is another sign (I do not know whether he mentioned it or not) and that is the so-called Eustace-Smith sign. This sign is obtained by auscultating the manubrium and having the child bend back its head, and we get a venous murmur in some cases.

A word with regard to the bronchial character of the respiration and of the voice below the normal limits. I think it has been shown very clearly that the normal limit of the bronchial voice is the seventh cervical vertebra. I regard any continuation of the bronchial voice or whisper or breath sound below the seventh cervical vertebra as being suggestive of bronchial gland enlargement.

One word with regard to the Von Pirquet skin reaction. We have the accurate figures of Hamburger and Von Pirquet. Hamburger says that he gets a percentage of 94 in children up to the age of 14, and Von Pirquet a somewhat lower percentage, obtained from poor children in the hospitals in Vienna; but subsequent figures have not given such large percentages by any means. I feel from the few cases I have had under examination and from the recent literature that the Von Pirquet skin reaction is a valuable sign in children not only up to the age of three years, but that any reaction under the age of ten means not only tuberculous infection, but should make us suspicious of tuberculous disease as well.

*Dr. Moor (closing).*—There were one or two points that were touched upon in this paper so hurriedly that I do not know whether the members could easily get an idea as to their importance.

I have been recently struck with the number of cases of tuberculous infection, and in some cases tuberculous disease, in children, where the source of infection was undoubtedly tuberculous diseases in one of the grandparents. Active pulmonary tuberculosis is not generally found in the aged, but where it does exist in an old person the course seems to be very chronic, and the diagnosis is often left in doubt for a long time.

We all know that, in the South at least, where there is a grandmother in the house, she usually takes care of the babies and younger children and may be, therefore, an important factor in the spread of disease.

The development of tuberculous disease as the result of tuberculous infection in childhood, as Dr. Frazer mentioned, is one of the things that we absolutely can not figure on. As he stated, and very luckily, the great majority of the children who are infected live to a ripe old age and die from something else, never having had any clinical signs of tuberculosis. On the contrary, just so long as there is any latent trouble anywhere, and more especially in the bronchial glands, lowered vitality from any cause may cause a flare-up. The consequence is that the child of a tuberculous family will always bear the most careful watching and even the simplest ailments must not be passed over lightly. I believe every child in whose family there is active tuberculous disease should receive from birth up to the point where he gets beyond all parental control, the same care and be kept under the same regime as if we knew that he had tuberculosis. It is good training for the mother; it gives the well child the best hygienic conditions, and may entirely prevent active disease in at least a certain per cent. of cases.

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## *AUTHORS' ABSTRACTS*

### *Medicine*

*Non-Tuberculosis Infection of the Kidney.* Claude G. Hoffman, Louisville, Ky. Kentucky Medical Journal, November, 1916, p. 568.

It was formerly believed that the kidney was immune to bacterial invasion, and for some time after renal infection became an established fact it was presumed the micro-organisms invariably reached the kidney through continuity of the urethral, vesical and ureteral mucosa (the so-called ascending infection), although it was noted that the bacteria most frequently found in the lower portion of the urogenital tract (Neisserian diplococci) were rarely demonstrable in the renal tissues.

The ureter is a propulsive organ, not merely a musculo-fibrous tube for conveying the excreted urine to the bladder; and the migration of bateria must be exceptional from below upward against the constant urinary stream. "Ascending infection of the kidney quite often takes place through either the lymph—or the blood vessels of the ureter. The lumen of the ureter is less often a factor in ascending infection of the kidney than has previously been supposed."

Infection of the kidney is favored by pre-existing disease, obstructive lesions, local hyperemia, etc. It has been said to follow urethritis, prostatitis, cystitis, ureteritis; hemorrhoids, proctitis, sigmoiditis, colitis, appendicitis; bronchitis, otitis, menigitis, tonsillitis, pneumonitis; hepatitis, pancreatitis, cholecystitis; typhoid fever, scarlatina, malaria, diptht heria; salpingitis, endometritis, oophoritis, peritonitis; nephroptosis, coloptosis, gastroptosis; any change in the relative position of the intra-abdominal and intra-pelvic viscera which may cause renal or ureteral disturbance, with consequent obstruction to the urinary outflow, may be a contributing factor in the production of kidney infection.

In bilateral renal infection from any cause radical surgical treatment is for the most part contra-indicated. In unilateral infection, exposure by laparotomy, puncture of existing superficial

cysts or abscesses, decapsulation with or without nephrotomy, drainage, resection, nephrectomy, are accepted procedures. In virulent unilateral infection, the other kidney being anatomically and functionally normal, it is suggested that to temporize with conservative operative measures oftentimes merely means to court disaster, and primary nephrectomy is the safer and more satisfactory procedure from the standpoint of both the surgeon and the patient.

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*Diathermia in the Treatment of Trifacial Neuralgia.* Heinrich F. Wolf, New York, N. Y. Medical Record, December 30, 1916, p. 1152.

The author recommends the use of diathermia in all forms of trifacial neuralgia. The mild cases, the neuralgia in the old people and the typical tic douloureux are very favorably affected by the diathermia. But those neuralgias in the adult, which cause continuous pain with exacerbations, with paraesthesia in the mouth, and which are evidently due to degenerative changes in the ganglia, are apparently refractory to the treatment.

He reports 13 cases. The strength of the current 700 to 1,000 milliamperes. The duration of each treatment is one-half to one hour.

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*Ultraviolet Rays in Skin Diseases.* Fred Wise, New York, N. Y. New York Medical Journal, Vol. CV, No. 5, February 3, 1917, p. 196.

The author briefly narrates his experience in the use of the ultraviolet light in the treatment of skin diseases. His experience is based upon cases treated exclusively in private practice, during the past two and a half years, with both the Kromayer lamp and the Alpine Sun Lamp. He states that while many writers have published too sanguinary and exaggerated reports regarding the healing properties of the light in cutaneous diseases, others, on the other hand, have shown a hypercritical tendency to decry the light treatment. Of the latter, very few have had sufficient personal experience to be able to pass judgment on the value of these rays and are therefore usually not qualified to give dependable opinions.

Wise undertook to treat a series of unselected skin diseases, occurring in the regular routine of dermatological practice, and he calls attention to the circumstances that these cases were not chosen to demonstrate the action of the rays in any particular class of dermatoses. He states that he was disappointed in cases of psoriasis, acute and subacute vesicular eczema, infectious eczematoid dermatitis (only one case), and one case of cutaneous pruritus. His results were fair, but by no means brilliant, in lupus erythematosus and alopecia areata. He calls especial attention to the circumstance that too few examples of the above mentioned diseases were subjected to the rays to justify passing final judgment upon their value.

A very extensive case of angioma serpiginosum, recalcitrant to all other forms of treatment, responded at once to the ultraviolet light, the patient's skin returning to a normal condition. Parapsoriasis lichenoides chronica, sycosis vulgaris, chronic eczema, lichen chronicus, lichen planus, chloasma, keratosis pilaris acanthosis nigricans, rosacea, furunculosis, acne vulgaris, lupus erythematosus and vascular naevi, all of these conditions were very favorably influenced. In premature loss of hair and in the regeneration of hair, in selected cases, the author believes that we have in these rays a remedy far superior to all other forms of therapy.

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*The Alimentary Tract as a Focus of Infection.* W. G. Richards, Billings, Montana. The Journal-Lancet, January 15, 1917, p. 45.

The author maintains that while the attention of the medical profession has been rightly directed during recent years to the importance of small foci of infection in the causation of chronic disease, too little attention has been paid to the far more important focus in the alimentary canal itself. The general symptoms of all infections are due to the absorption of degradation products produced during protein digestion, whether these be the result of parenteral digestion of bacteria, of food or bacterial proteins from the intestine. In the alimentary tract are at all times conditions comparable to those which exist in a chronic abscess, proteins being broken down and their contained poisonous group set free, the absorption of which during conditions of stasis produces effects similar to those of chronic suppuration. Furthermore, with the gut converted into a living culture tube bacteria naturally travel to the communicating organs and adnexa, causing chronic appendicitis, cholecystitis, pancreatitis, or gastric or duodenal ulceration, or they may be conveyed by blood or lymph currents to near or distant organs, establishing secondary foci of infection. The author pleads for a broader conception of such conditions as chronic appendicitis and cholecystitis, and deprecates the removal of these organs without efforts for the cure of the underlying causative condition of stasis, the principle to be followed in all cases being the establishment of adequate intestinal drainage, by medical means if possible, but otherwise by resort to some method of "alimentary orthopedics."

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*The Roentgen Ray in the Diagnosis of Pulmonary Tuberculosis.* Judson Daland, Philadelphia, Pa. New York Medical Journal, Vol. CV, No. 5, February 3, 1917, p. 199.

The Roentgen ray has recently made encouraging advances in the diagnosis of diseases of the thoracic cavity. By the use of anterior posterior oblique successive and stereoscopic plates information not otherwise obtainable is gained.

The Roentgen ray reveals more tuberculosis than physical signs would indicate and is especially valuable when the lesions are small, scattered or deep. The plates also furnish a permanent record of the progress or recession of the disease. The difference between the sharp, definite shadows of an old tuberculosis and the indefinite outlines of fresh infiltration indicate a new field of study.

Progress in the Roentgen diagnosis of tuberculosis depends upon refinements of technique, origination of new methods, improvement in the interpretation of the plates, combined with the infor-

mation possessed by the clinician and pathologist. The fluoroscope gives important additional or corroborative information. An accurate knowledge of pathology is necessary to the interpretation of Roentgenograms, since shadows on plates are solely due to differential densities.

The Roentgenologist observes living pathology, and his findings throw valuable light upon the results of physical examination, whereas the pathologist usually secures material for study after the death of the patient.

Most cases of tuberculosis with bacilli in the sputum may be independently diagnosed by the Roentgenologist, and in many cases where no bacilli are found the Roentgen diagnosis is correct. Although pulmonary tuberculosis is often more or less easily diagnosed by clinical methods, the Roentgen ray so frequently reveals new or unexpected conditions that in the future no case will be considered as having been thoroughly studied without a Roentgen examination.

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*A Study in the Diagnosis and Treatment of* 250 *Cases of the So-Called Neurasthenias.* Saul Danzer, New York, N. Y. Medical Review of Reviews, Vol. XXIII, No. 2, February, 1917, p. 90.

Neurasthenia as a clinical entity does not exist, because of its manifold symptomatology and etiology. If treated as a clinical unit, failure results. In order properly to classify these cases, one must observe the following: (a) blood pressure, (b) psychic and emotional status, (c) sexual state, (d) whether the neurosis follows an injury, (e) whether the patient is obese or emaciated, (f) whether there are associated gastro-intestinal, metabolic or infectious diseases, (g) condition of the pluriglandular and vaso-motor systems, (h) whether the social condition bears an etiological relationship.

I. *Sexual Neurasthenias.*—These respond well to hydrotherapy and electrotherapy.

II. *Psychasthenias.*—These do best under psychoanalysis and psychotherapeusis.

III. *High Blood Pressure Cases.*—They respond well to eliminative measures through the bowels, kidneys and skin.

IV. *Low Blood Pressure Cases.*—Treat them with stimulating procedure (showers and wet packs), the temperature of the water being reduced at successive times.

V. *Post-Traumatic Neurasthenia.*—The "rest cure" of S. Weir Mitchell or a modification does well.

VI. *Obese Type.*—Eliminative methods, exercise and regulation of the diet are indicated here.

VII. *Emaciated Type.*—Superalimentation and the rest cure work well here.

VIII. *Gastro-intestinal Type.*—Treatment is naturally directed toward the underlying condition.

IX. *Toxic Conditions.*—Infections (syphilis) and intoxications (lead, alcohol, etc.) require appropriate treatment.

X. *Metabolic Disturbances.*—Gout, diabetes and disturbed intermediary metabolism should be properly treated.

XI. *Pluriglandular Diseases.*—The depressed type, if showing evidences of early hypothyroid symptoms, should be treated with thyroid even before the onset of myxedema.

XII. *Social Group.*—Correct the social condition whenever possible.

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*The Occurrence and Treatment of Pain in Locomotor Ataxia.* Edward Livingston Hunt, New York, N. Y., The Medical Council, January, 1917, p. 33.

Pain in locomotor ataxia is a leading symptom, occurring in 90 per cent. of the cases. The character of the tabetic pain is sharp and shooting. The distribution follows the anatomical distribution of the lesion, and is usually in the lumbar region.

There are other sensations occurring in tabes, such as sensitiveness, tenderness, and the so-called girdle sensation. All, including pain, are most frequent in the first stage.

The treatment of locomotor ataxia should include, first, simple external remedies, such as hot-water bags, iodin, mustard, ironing, ices, sandbags, dry cups, cautery, chloroform liniment, firm bandaging, massage and faradization. If, in spite of these remedies, there is no relief, the patient should be put to bed and resort had to internal remedies. The best drugs to select from are aspirin, pyramidon, antipyrin, codeine, salipyrin and sodium salicylate. Finally, there is the hypodermic of morphine which should only be given by a physician as a last resort. There are occasions, however, when this treatment is imperative. It is a curious, but none the less true, fact that the particular remedy which will at one time relieve an attack of pain will at another utterly fail.

Prolonged periods of rest and nourishing food are powerful aids. The best remedy of all is intravenous or intraspinous medication. It matters little whether the drug is salvarsan or neo-salvarsan. These intraspinous injections relieve tabetic patients suffering from bladder disturbances, stiffness and pains in the legs. This form of treatment is especially of value in relieving the attacks of pain, and is one not sufficiently recognized. It should be more frequently used.

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*The Relation of Sore Throat to Intestinal Infection.* Douglas H. Stewart, New York, N. Y., American Journal of Clinical Medicine, January, 1917, p. 15.

It has been urged that proctitis cannot come from a sore throat, because of some such rule as that "the infection of an orifice comes from its mouth." It suffices to point out for study any fistula which has broken through the skin or the carbuncle and crater of diabetes. It is even now maintained that Samuel Cooper was quite right in the observations which he published in 1807 and which state (page 33) that "to the surface secreting it, pus is quite unirritating, though it may greatly irritate any other." We have not, in our time, weakened his observation by stating

that a wall of antibodies and leukocytes protects the secreting tissue. The essential value to the clinician lies in the statment as it was originally written. Whatever the human economy was planned for, it was not intended to digest pus. Even germs themselves break down and melt tissue by a process closely akin to peptonization, so that that is no bar to their action. The wonder is not that the effects of passing mucus-protected pus-germs through the alimentary canal are bad and are generally ignored; yet, they are not so bads as one would imagine they would be if the specialist in gastrointestinal troubles will do two things; first, he will assert that mucus in the feces is not necessarily an evidence of lesion of the alimentary tract; second, he will not look into the nasopharynx for the source of the mucus.

Pyorrhea, alvelor abscess, and the like, seem to show their effects more as a toxemia than locally, that swallowed germs are inert is hardly credible. that swalloed germs are inert is hardly credible. They do not seem to be inert when taken out of the feces and cultivated. Of course, in this matter, overgrowth, unfavorable environment, and other factors are to be considered; also that the streptococcus or the staphylococcus are like pet dogs enjoying themselves in rumaging a garbage-can—these germs can become scavengers if they choose. In other words, these cocci are facultative and saprophytic and can live on dead fish quite as well as on the mucuous membranes of a human throat. On the nonresistant putrid fish, they produce both an enzyme and a toxin. One can hardly believe that swallowing the toxin that is produced on the fish will cause the rapid death that it brings on, and then, subsequent to declaring such belief, expect any confidence in the idea that the same germs, working upon the contents of the alimentary canal and aided in attacks on its walls by an enzyme, should prove inert.

Providing the patient can swallow, tension, congestion, and all will disappear like magic from a throat if, in addition to local measures of a proper sort, the patient is given 30 grains of compound jalap powder with 1-3 grain of saccharin and 2-3 of a drop of oil of cinnamon; three such powders being given, spaced one hour apart. That the jalap must be up to standard would seem self-evident, were it not for many disappointments which arise from a contrary condition.

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*X-Rays in the Diagnosis and Treatment of Thyroid and Thymus Enlargement.* A. Judson Quimby, and Will A. Quimby, New York, N. Y., Medical Record, January 6, 1917, p. 13.

The writers have found in over 250 cases referred for diagnosis and treatment that the presence of enlarged thymus is so frequent in exophthalmic goitre as to make it necessary to examine [illegible] for persistent thymus in all cases. It [illegible] be looked for in other types of goitre, [illegible] ere the chest symptoms occur. [illegible] ymus must be distinguished from in[illegible] oid enlargement and numerous [illegible] ions within the chest. The char[illegible] ymus shadow is dwelt upon and the [illegible] tibility to the therap[illegible] effects of X-rays is emphasized. They believe that the marked results obtained in X-ray treatment of exophthalmic goitre are in the cases possessing enlarged thymus, and that the greatest benefit is derived through the treatment of the thymus. The response to X-ray treatment is very prompt in some cases, relief occurring within a few hours, and is most marked in children.

A special warning is given concerning the administration of X-rays and the harmful effects resulting from over exposure. The importance of protecting the surrounding parts is emphasized, especially adjacent glandular structures, such as the salivary glands and breasts. X-ray treatment should only be administered to the younger subject with the greatest care. Some of the finer points in technique may be disregarded in treating the aged. Fifty-three cases were treated by the X-ray in conjunction with a surging high potential current, with evidence of increased benefit and less dangers of burn. They conclude that the relief symptoms justifies X-ray treatment in thyro-thymic enlargement.

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*The Interpretation of Certain Blood Pressure Ratios.* Willard J. Stone, Toledo, Ohio, American Journal of Medical Sciences, Vol. CLIII., No. 2, February, 1917, p. 240.

The pressure-rate is the ratio existing between pulse-pressure and diastolic pressure. Under normal conditions the pulse-pressure is equal to 40-60 per cent. of the diastolic pressure. The diastolic pressure is the index of arterial tension and represents arterial resistence while the pulse pressure represents cardiac work. Two groups are recognized. In the first, vascular changes have produced rigid as well as contracted vessels. The diastolic pressure is consequently increased. The pulse-pressure is increased in normal or increased ratio if the heart is in compensation. This group includes the diffuse types of chronic nephritis. In 42 cases the average diastolic pressure was 132, the pulse-pressure 68, making the systolic 200. The pressure-ratio was 51 per cent. Within three years' observation the mortality was 48 per cent. and was due to cerebral hemorrhage, thrombosis, or cerebral edema commonly called uremia. This group was designated as *cerebro-renal.* In the second group of hypertension, designated as *cardiac*, the vessels are rigid but not contracted. The diastolic pressure is therefore not high but the pulse-pressure is increased. This group is made up of valvular ard aortic lesions. In 32 patients the average diastolic was 93, the pulse pressure 85, making the systolic 178. The pressure-ratio was increased to 92 per cent. Symptoms of nephritis were absent in this group and a cardiac death occurred from dilatation or exhaustion in 25 per cent. within three years of observation. Cardiac dilation was accompanied by a fall in the pulse-pressure and a decreased pressure-ratio. The prognostic point of value in the cerebro-renal group is the height of the diastolic pressure. In the cardiac group the prognosis seems to depend upon ability of the heart to sustain the increased pulse-pressure and pressure-ratio necessary to adequately supply the periphery with blood.

# TROPICAL DISEASES AND PUBLIC HEALTH

## A PLEA AND A PLAN FOR THE ERADICATION OF MALARIA*

By Frederick L. Hoffman, LL.D.,
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After restating the resolution adopted by the Second Pan-American Scientific Congress, to the effect that a united effort should be made in the furtherance of methods and plans for the eradication of malaria throughout the Western hemisphere, Dr. Hoffman first presented a carefully considered plea in behalf of the plan adopted by the National Committee on Malaria Eradication providing for effective governmental, state, municipal, corporate and general co-operation in the direction of well-considered methods and means aiming at the gradual eradication of malaria in every section of the United States where the disease is known to prevail. The vast amount of experience which has been had in foreign countries, particularly at Panama, in the East Indies and on the West Coast of Africa, was described in some detail as evidence of the feasibility of corresponding engineering and other plans adapted to the special requirements of such sections of the Southern and other states as suffer more or less seriously from malarial diseases. On the basis of at least approximately trustworthy returns for the different sections of the country it was estimated that the annual mortality from malaria throughout the United States during 1916 would be about 15,000 and the approximate number of cases was estimated at 1,000,000 per annum. Aside, however, from the direct mortality and morbidity loss, it was pointed out that malaria seriously complicated practically all other important diseases and even pregnancy and surgical operations, so that the preceding estimate represented only in part the social and economic loss to the nation in consequence of the uncontrolled frequency of malarial disease at the present time.

Following the plea, Dr. Hoffman presented in brief outline an elaborate plan, as agreed upon or to be agreed upon by the National Committee on Malaria, of which Dr. W. C. Gorgas, Surgeon General of the U. S. Army, is the Honorary Chairman, and Dr. Rupert Blue, Surgeon-General of the U. S. Public Health Service, is Active Chairman, and Dr. Seale Harris, of Birmingham, Ala., is the Secretary. The plan included the organization of active sub-committees on Administration, Entomology, Medical Research, Education and Publicity, Sanitary Engineering, and Statistics. The plan in detail provided, among others, for the special consideration of ways and means, and a recommendation for the adoption of a resolution by the Southern Medical Association in favor of a thorough preliminary investigation of the subject by the Senate Committee on Public Health and National Quarantine, with the further suggestion of a Federal appropriation of $250,000, more or less, to be expended in the furtherance of the plans and purposes of the Committee under the direction of a special Federal Board of Executive Advisers, consisting of the Surgeon-General of the U. S. Army, the Surgeon-General of the U. S. Public Health Service, and the Secretary of the U. S. Department of Agriculture. In detail the plan of co-operation provides for the active assistance of the Director of the Hygienic Laboratory of the U. S. Public Health Service, the Chief of Engineers of the U. S. Army, the President of the Mississippi River Commission, the Surgeon-General of the Navy, the Director of the U. S. Geological Survey, the Director of the U. S. Reclamation Service, the Chief of the U. S. Weather Bureau, the Chief of the Bureau of Soils, the Chief of the Bureau of Entomology, the Chief of the Bureau of Biological Survey, the Chief of the Division

*Author's Resume of an Address before a joint session of the Section on Medicine and Section on Public Health, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

of Vital Statistics of the U. S. Census, and the Assistant Secretary in charge of the National Museum.

In the direction of the Pan-American co-operation the plan suggests the active interest of the Pan-American Union, the International Sanitary Congress, the International High Commission, and the Assistant Secretary of State in charge of Latin American affairs.

In the direction of state co-operation it is suggested that active assistance should be rendered by the State Board of Health, the State Engineering, Drainage or Reclamation Commissions, the State Geological Survey, the Scientific Departments of the State Universities and the State Department of Agriculture. Similar co-operation is required from the corresponding county and municipal authorities.

Since it is of the utmost importance that the plan of malaria eradication resting largely upon medical and engineering considerations should have the benefit of active co-operation on the part of all agencies, whether corporate or otherwise, interested in public health conservation, preventive medicine, etc., it is recommended that among others the assistance of the following bodies should be enlisted: The International Health Board, the Carnegie Institution, the American Public Health Association, the Southern Sociological Congress, the American Medical Association, the Southern Medical Association, the American Climatological and Clinical Association, the American Academy of Medicine, the American Entomological Society, the American Microscopical Society, the American Nature Study Society, the American Society of Civil Engineers and the American Museum of Natural History.

On account of the necessity of a nation-wide educational effort, it is suggested as particularly important that there should be the most hearty and continued co-operation on the part of the United States Bureau of Education, the state, county and municipal educational authorities, the Council on Health and Public Instruction of the American Medical Association, and the press.

Among other bodies whose co-operation would be most useful and in fact indispensable to the attainment of far-reaching and permanent results are the steamship companies, chiefly such as are engaged in Latin American commerce, Southern railway companies and river transportation lines, life insurance companies and the Life Extension Institute.

Under the direction of an active Advisory Council, in which all or most of the foregoing official authorities, corporate bodies and other agencies would be represented, the method of procedure to be followed would include malaria and mosquito surveys in all sections more or less subject to malarial disease; malarial indexes, chiefly of children, ascertained by means of medical school inspection; public education, chiefly through the public schools, in the essential principles of malaria, and public lectures, including visual instruction in the fundamental facts of the mosquito transmission of the disease; improvements in medical education, particularly as regards the more accurate differentiation of the several types of malaria and essential improvements in death certification; public facilities for the free microscopical examination of the blood; local collections of prevailing species of mosquitoes and their proper preservation; active efforts in the enforcement of local ordinances providing for the compulsory notification of malarial disease; active efforts in behalf of state drainage commissions and state drainage districts; the more adequate support of schools of tropical medicine, and the ascertainment by means of thoroughly specialized scientific investigations of the geographical distribution of malaria throughout the Western hemisphere; and of the achievements and possibilities of malaria eradication in the countries of South America; the coordination of corresponding efforts in the non-contiguous possessions of the United States, chiefly Porto Rico and the Panama Canal Zone; meteorological considerations suggestive of the more extended scientific study of the correlated phenomena of malaria occurrence and meteorological conditions; statistical considerations as regards the more accurate ascertainment of the elementary facts of malaria mortality and morbidity, and the variations of incidence according to age, sex, race, occupation, institutional treatment, etc.; the methods and results of quinine prophylaxis; the study of the institutional treatment of malaria, with a particular regard to au-

topsies, historical research into the past history of the disease, botanical and zoological research, particularly as regards the possible control of malaria by means of trees, plants, fishes, etc., and, finally, the ascertainment of the approximate economic loss, particularly in the case of plantation labor, in consequence of malaria, more or less in conformity with the methods adopted by the U. S. Public Health Service and the International Health Board.

In support of the plea and plan for malaria eradication Dr. Hoffman, in conclusion, presented a brief analysis of the results of a comprehensive statistical study of malaria frequency throughout the world. He directed attention to the remarkable decline in malaria in Southern states as well as in certain Northern states where formerly the disease prevailed to a not inconsiderable extent. In New Jersey, for illustration, the malaria death rate had been reduced from 37 per 100,000 in 1881 to only 0.3 during 1914; in Connecticut, from a maximum of 21.3 per 100,000 during 1881 to 1.0 during 1914; in Memphis the rate had been reduced from 227 per 100,000 in 1885 to 55 during 1914; in New Orleans, from 163 per 100,000 in 1885 to 9 during 1914; and in Jacksonville, Fla., from 278 per 100,000 in 1901 to 6 during 1914. These gratifying changes in the malaria death rate, North and South, he said, could not, however, be made to apply to the rural sections, particularly of the Southern states, where, as for illustration, in certain portions of southeastern Missouri, malaria continued to prevail to an alarming degree. He directed attention to the fact that the malaria death rate of Duncklin County, Missouri, was higher than the corresponding malaria death rate of well-known fever centres in the West Coast of Africa and the West Indies. Considering, however, the statistical evidence of the results of antimalarial measures at Panama, the Straits Settlements, the West Coast of Africa, and elsewhere, he said it was self-evident that similar results could be achieved throughout the Western hemisphere wherever malaria was known to prevail, but only through the active and hearty co-operation of federal, state and local government authorities, assisted by corporate and other bodies interested in the prevention of disease and the prolongation of human life.

Such efforts, he felt sure, would not in the long run prove excessively expensive, but, much to the contrary, it was practically certain that even heavy local expenditures in behalf of malaria eradication would yield a return many times in excess of the original cost in consequence of an increase in land values and better opportunities for the more effective utilization of local natural resources. In any event, he said, the Nation was under the most solemn obligation as a matter of international agreement to assist in every reasonable way in the proposed effort at malaria eradication, and since such an effort was entirely practicable and of enormous public interest, it was to be hoped that the plan proposed by the National Committee on Malaria would be approved and receive the necessary financial and other support and co-operation on the part of the Federal government, the states and the localities directly concerned.

## INFANTILE PARALYSIS

By W. A. Evans, M.D.,
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*Editor's Note.—Dr. Robert Wilson, Jr., President of the Southern Medical Association, in introducing Dr. Evans, said: "The lecturer whom we shall have the pleasure of hearing this evening, although coming to us from Chicago, is really of the South, having been born in Alabama, brought up in Mississippi, and educated in Louisiana; but for the last twenty-five years he has been living in Chicago. Formerly, he was Health Commissioner of Chicago, and is now Health Editor of the Chicago Tribune. A few days ago he was honored by being elected President of the American Public Health Association."*

Last May, after a winter during which there had been an occasional case of infantile paralysis in New York City, there began to develop an unusually large number of cases in the western part of Brooklyn, in a little district just south of Greenwood Cemetery. These cases were overlooked. The majority of them were unrecorded and probably unrecognized. Some time about the middle of June a

*Address, Public Meeting, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

sufficient number of cases of this disease had been reported to the New York Department of Health to excite its interest and curiosity, and an investigation was begun which disclosed the fact that there had been an unusually large number of cases of this disease in Brooklyn during the preceding month. But by the time the investigation had been concluded it was evident to those who were in charge that an epidemic existed, which proceeded through the summer with an increasing number of cases. The epidemic waged, reaching its maximum in the week of August 12, during which week there were 1,200 cases of this disease recognized and reported by the New York Department of Health. It was found that a focus would begin, would rapidly increase for about six weeks, would reach its maximum at the end of six weeks, whereupon there would ensue a period of gradual decline. But by reason of the fact that in this great community there were thousands of smaller communities, naturally the epidemic would travel from one focus to another, and from a new focus a number of cases would multiply until at the end of about six weeks' duration that focus would reach its maximum, whereupon it would begin to decline.

During the summer and fall months in that City there were approximately 12,000 cases of infantile paralysis. Within fifty miles of the lower end of Manhattan Island, in these four or five months, there were more than 15,000 cases of the disease. Probably in no previous year in the entire world's history had there been 15,000 cases of infantile paralysis. We have, therefore, just gone through the most extensive and the most malignant epidemic of infantile paralysis that the world has ever known. However, since August 12 the disease has been on the decline, a decline at first somewhat gradual and slow, but later more rapid until at the present time we may say that there is nothing more than the embers of that epidemic. It is a thing of the past. And if that be true, then why is it that we are [illegible] g up your time in considering this [illegible] ? If it is a matter of history, how- [illegible] dern the history may be, there is [illegible] e face of things no reason why you sh[illegible] er an evening to learning about infantile paralysis, and particularly why you should be appealed to, as I shall appeal to you during the course of the evening, to do your duty in connection with this disease. Now, why? This is the reason why.

It is the history of this disease that it has never begun violently in the same community two seasons in succession, but that in a succeeding season in which it has been violent in one part of the country, or one section, or one district, it is violent in some other part of the country. The theory is that when it invades a community in epidemic form, that practically every person in that community who has not a natural immunity acquires immunity either by an attack of the disease or by becoming infested with the micro-organisms of the disease, and infested in such a way that atypical illness will result, but nevertheless immunity is acquired. Those people who have either had the disease, or have otherwise acquired immunity in some degree, remain as carriers and can be the cause of the disease and later spread it to others.

You will understand that it is not a something created *de novo*. It is not a something that originates out of nothing. It is a living, active thing, and it must be kept alive by some agency capable of supporting life in it. There is no reason for believing,—in fact there is every reason for disbelieving,—the possibility that it can remain alive in water, in milk, in air, in dust, and in dirt. There is no reason for believing that it can winter over from season to season in an insect or in the body of any animal other than man. There is every reason for believing that the agencies that are harboring this hibernating organism in this winter season are human beings, some in New York City, some in Atlanta, some in San Francisco, and some in Chicago, harboring this organism and ready to feed it, when the time is propitious, back to those who are susceptible of having it.

The reason that it is worth your while considering infantile paralysis tonight is that the teaching of experience is that during the year 1917 this disease will be epidemic in some part of the United States, probably not in New York City, or in its immediate environment; probably in some part of the country distant from New York City, and possibly in At-

lanta. Quite certainly, men who are within the hearing of my voice, men who are in this hall tonight, before the year 1917 shall have ended will be brought in contact with epidemics of infantile paralysis. Men who are listening to me here this evening will be called upon to control an epidemic of this disease concerning which they know nothing, and other men will be called upon to diagnose and treat and to give expert attention to and care for cases of a disease with which they have had no experience. It behooves you, therefore, to learn of it before the oncoming of the next season.

Now, a word or two briefly as to infantile paralysis to the men who practice curative medicine. In all probability, the bacterium which is responsible for this disease is known. In 1912 or 1913, Flexner succeeded in growing the coccus of infantile paralysis and he succeeded in inoculating animals with this coccus and producing the disease in the inoculated animal. That information has been in hand for three years, and yet for practical purposes in this epidemic it has been of no service, and why? Because in the stage of the discovery, the information about it was only valuable in laboratories which were well equipped with apparatus and with men, and as a diagnostic procedure it has been of no help in this epidemic.

Within the last few weeks there have been additional discoveries which have come out of this epidemic which place the laboratory procedures at the service of the departments of health. The latest of these discoveries was announced in the *Journal of the American Medical Association* on Saturday of last week. Dr. Nuzum, of Chicago, collaborating with Dr. Herzog, has rediscovered the Flexner coccus of infantile paralysis. The additional discoveries that he has made, or they have made, have made Flexner"s discovery available for practical diagnostic laboratory purposes, consisting in this: they have succeeded in finding the organism in the cerebrospinal fluid by prolonged centrifugalizing and staining of sediment. That, of course, means an immediate diagnostic procedure. By growing this organism from the cerebrospinal fluid in acetic broth or broth containing a little bit of kidney tissue, they have been able to get a good growth within twenty-four to thirty-six hours, and that is a practical laboratory procedure. It is grown in the oven at 35° C. or at 95° F. It appears as a cloudiness in the bouillon, and at the end of another 12 to 24 hours this cloudy material settles to the sides and bottom of the test tube. The longer the organism grows, the larger it becomes. At its beginning, it is in a great measure an ultramicroscopic micro-organism or coccus which Flexner discovered. At the end of twenty-four hours a moderate proportion of the cocci are large enough to see with ordinary microscopic magnification. At the end of forty-eight hours a considerable proportion of them are visable with the ordinary immersion lens. A swab culture grown on blood agar slants will grow as a large coccus, easily seen under microscopic magnification.

This organism can be and has been injected into lambs, into rabbits, and into monkeys, producing flaccid paralysis, which is quite the same disease clinically as infantile paralysis in the human subject.

The organism secures entrance to the human body through the mouth or nose, and from this atrium travels to the spinal canal; some authorities say by the lymph routes, others say by the blood stream, when it reaches the cerebrospinal canal. It affects first, the spinal meninges in the region of the posterior roots, and that is an explanation of the pain and tenderness which in the usual case is a forerunner of the paralysis. It extends from there to the anterior part of the cord, and later involves in a destructive way the motor cells of the anterior horn. There is a definite sequence according to most authorities between the beginning of the disease in the posterior horn, or rather in the vicinity of the posterior nerve roots, and the later destructive development of the disease in the motor cells of the anterior horn. I shall tell you something about the percentage of certain clinical phenomena and certain principles of treatment that are dependent upon this lapse of time. So much for the pathology of the disease and something of its symptomatology.

I shall not occupy your time in detailing to you all the symptoms of the disease in that form where there is a violent onset,

with rapidly developing paralysis or convulsions, or other evidence of violent disease. I want to concentrate your attention upon the atypical form of infantile paralysis, a disease which begins much as does an ordinary attack of "summer complaint," a mild degree of fever, and some intestinal disturbance; and the keenest of diagnosticians, with nothing save these symptoms in mind, will fail to make the diagnosis more frequently than he will succeed. But if a man is alert, he will note presently the development of an unusual degree of tenderness and pain in joints and in limbs, a degree of pain that is not present in the ordinary distemper or ordinary febrile processes in the summer season.

I want to caution you to be on your guard for those cases of apparent distemper which is the cause of a mild febrile attack in summer that develop an unexpected and otherwise inexplicable amount of tenderness and pain in joints. In a certain percentage of cases, somewhere between the first and sixth day of the disease, paralysis ensues, starting gradually in a certain sense, and yet in another sense not gradually, for the disease at its very beginning, from careful analysis and careful search, presents more of paralysis than it does at a later time. In the more violent cases paralysis develops on the first day. In a considerable percentage of cases it does not develop until the sixth day, and other cases are in between. The importance of that lies in this: that before the development of the paralysis it is exceedingly difficult and oftentimes impossible for any practitioner of medicine, however alert he may be, to diagnose the disorder.

Our terror of this disease is not dependent upon the death rate, for the death rate is not high. In the Massachusetts epidemic there was a death rate of 8%, which means that eleven-twelfths of all people who develop infantile paralysis recovered more or less completely. The highest death rate from infantile paralysis in this country is the death rate in the recent epidemic in New York City. It seems that in that epidemic there was a death rate of 22%, and that means that of those who developed the disease in New York City, three out of every four recovered more or less completely. Then, our terror of infantile paralysis is not due to its high death rate, for there are many diseases that have a higher mortality. It is due to the terrible results that follow in those who recover from the disease. It is due to the fact that we have people constantly before our eyes dragging their limbs around. It is due to this that this disease strikes so much of terror, and yet not all of the cases of infantile paralysis develop paralysis of those that recover. Somewhere between 40 and 50% recover without any permanent paralysis or wasting of the limbs. In the New York City epidemic 81% of those who died, died in the first week of the disease, 11% in the second week, 3% in the third week, and 3% after the third week.

A word or two as to the treatment. A few years ago it was said that we should treat infantile paralysis witn urotropin. It has been demonstrated by the work of Hanslick and others that urotropin can not possibly be of any service in this connection. In the first place, it is not an antiseptic as urotropin; it does not become an antiseptic until it has been decomposed and formalin has been formed; and it does not produce formalin except in an acid medium. None of the tissues in which the coccus of infantile paralysis is present is acid, and therefore it is not antiseptic in this disease.

A while ago it was noticed that a considerable percentage of the people who died of infantile paralysis succumbed early, before there was time for destructive degeneration of the cells of the anterior horn. It was noticed, furthermore, that there was a primary period during which the symptoms were violent, and not infrequently during which death would ensue from embarrassment of respiration, and if the person could live through that period he would get better and remain better for a certain length of time until there began to appear that train of symptoms that resulted from the breaking down of the cells in the anterior horn. Out of that observation there grew the recommendation by Meltzer that adrenalin be injected into the cerebrospinal canal, the idea being that he would prevent in this way congestion of the meninges and pressure that was responsible for the embarrassment to respiration, an embarrassment which not infrequently

terminated in death; that if he could tide his patients over that period, there was a possibility of their withstanding destructive effects of the disease, and so he made the proposal that adrenalin be injected. A little later he believed there might be some specific action from adrenalin. His remedy has been more or less tried out during this epidemic. There is a report by Hoyne indicating that it may be of some value. The majority of observations, however, during this epidemic, so far as I have been able to learn, do not indicate that this treatment is of any particular value.

In 1910, Flexner demonstrated that it was possible to prevent the development of paralysis in monkeys having infantile paralysis by injecting into their spinal canals blood serum from persons or from monkeys who had recovered from the disease. A little later Nettar, in France, applied this observation practically in the treatment of human cases of infantile paralysis. The first case in which it was employed was a man with a severe attack of the disease, one in whom there seemed no possible outcome save death. However, that man recovered, and then he tried it in others. It has been employed in this epidemic in more than thirty-five cases, but it does not seem to be giving such good results in the United States as it was indicated that it gave in France. What is the treatment, and what is the philosophy of it?

There are developed in people who have infantile paralysis certain antibodies which begin to make their appearance within five days after the onset of the disease. They remain in the cerebrospinal fluid for an indefinite time after the disease has begun. They have been found in the cerebrospinal fluid forty years after the onset of the disease. They are found in the cerebrospinal fluid of any individual who has been made immune by a severe attack, with paralysis, or by a light attack without paralysis. What Nettar did was to employ the blood serum of people who had recovered from the disease. Some had but recently recovered, and one individual had recovered thirty-eight years before. He injects 10 c. c. of fluid a day into the cerebrospinal canal; he makes six injections, making a total of 60 c. c. of cerebrospinal fluid used. The information which we have is that there have not been such good results from the use of this remedy in New York City as in the use of the remedy in Paris, so that, as the matter now stands, a physician would not be justified in treating the disease during its acute stage by putting in operation any treatment save what may be termed symptomatic treatment, — meeting symptoms as they arise.

And what is the acute stage? It is held that the acute stage runs from its onset to the time when tenderness disappears. The significance of that is this: manipulation, massage, and passive motion should not be begun until the acute stage has passed, but please note that for the recognition of the passing of the acute stage we are not dependent upon any technical procedure or any test which must be applied or can only be applied with great difficulty. We have the plainest of all guides, and that is this: does it hurt? If it hurts, or if it tires, or if it exhausts, you are beginning your passive motion and your exercise too early. If it does not hurt, then it is time to begin the manipulation of the limbs.

The second stage runs through the end of the period of tenderness to the end of two years. This period of convalescence is somewhat an arbitrary period. It is during this time that passive motion and massage are of most service. It is also during this period that it may be most harmful; for the muscles are easily tired or readily fatigued, and if they be stimulated beyond their point of endurance more harm than good results. And then comes the third stage, according to Lovett's classification of stages, the chronic stage, and it formerly was held that during this chronic stage there is no possibility of further improvement. In other words, whatever improvement takes place will be in the first two years, and after a period of two years has elapsed there is no further possibility of improvement. It has been proven that this conclusion is incorrect; that while improvement is difficult and slow, the possibility of improvement abides, and perhaps permanently abides. That is of interest to all practicing physicians as well as to health officers.

Infantile paralysis was first described, or was first recognized as a disease entity

in Austria, in 1840. The first report of an epidemic was in Lusanne, in 1841. Practically nothing was known of infantile paralysis until the beginning of this century. It is for all practical purposes a disease of the twentieth century. Since the year 1900 we have never been without infantile paralysis in the United States, and we can further say that no part of the United States has been free from some cases of infantile paralysis in the last sixteen years. However, during these sixteen years there has been some recompense for the wide distribution of the disease. There have been a multitude of careful and productive studies by Whipple, by Levaditti, by Peterson in Sweden, and by others. I would suggest that those of you who have access to the available records carefully study the report that was made to the Fifteenth International Congress of Hygiene and Demography on the epidemic of 1910-11 in Sweden, rendered into excellent English and found in most of the libraries in the United States.

In 1910, it was stated, and I believe correctly, that two-thirds of all the infantile paralysis in the world was in the United States, and I believe it is generally accepted at the present time that for the last sixteen years the United States has been a hot-bed of infantile paralysis and has been some recompense here, too. There have been a number of most excellent studies of its epidemiology made by the various departments of health and others in the United States. There have been excellent studies of the Buffalo epidemic, in 1912; of the three-year epidemic in Massachusetts, of the epidemic in Vermont, studies of the epidemic in New York City, in 1907 and 1910, and again this year, and a number of others that might be mentioned.

Probably the first valuable contribution to the epidemiology of infantile paralysis was that of Wickham. But we have made in this country two notable contributions, one by Caverly of Vermont, who demonstrated the fact that a great many of the people who are infected with this disease were either not sick at all or were mildly and most atypically sick. Caverly proved to the world that the largest factor in the spread of infantile paralysis was the person who was atypically sick, the person who was undiagnosed or wrongly diagnosed, or held to be a well person, a carrier of the disease, if you please. And the second great contribution is that made by the laboratory workers, the first being the contribution of a health officer and a clinician — Caverly. The contribution of the laboratory workers was first the discovery by Flexner of the coccus of infantile paralysis, its artificial cultivation, the production of the disease experimentally, and the late additions to the bacteriology of the disease, and perhaps the addition recently reported by Rosenow and his group, and more recently the additions made by Nuzum and Herzog, to which reference has already been made.

It has been demonstrated that infantile paralysis remains in the body of certain persons who have been infected with the disease for a period of five months; of monkeys that have been infected for a period of six months, and there is not only the possibility but the probability that it can remain in the noses of people who are acting as carriers for still longer periods. However, it has been proven that the period of infectivity in the average case does not last longer than six weeks, and therefore a six weeks quarantine period is long enough, for it fulfills all indications.

Every effort to control infantile paralysis is based upon the theoory that it is spread by contact and carriers; and yet it is with exceeding difficulty that we recognize the facts in relation to this theory. For instance, in New York City in this epidemic, in the report made about a month ago, it was stated that in 97% of the cases there was but one case to the family. In practically 3% of the cases there were two cases in a family; in three-tenths of 1% there were three cases in one family. In a very few cases—too few to figure in terms of percentage — there were four or five cases to the family. This conclusion has been criticised by the statement that the investigation did not determine how many people there were in those families who were capable of having the disease; yet there is the observation made in the Buffalo epidemic that answers that criticism.

In the Buffalo epidemic 263 cases were studied, occurring in 263 houses. One

hundred and forty-two of those cases were in families where more than one family was exposed to the disease. There was a total of 350 families who were exposed to these 142 cases. How many of them developed the trouble? There were four contact cases in three families. In one family there were two contact cases; in two families in each there was one contact case. How different that is, as you well know, from, let us say, yellow fever, in which White and Carter demonstrated that the disease would travel from house to house; that it was exceedingly loath to jump across the street or to invade the houses on the yonder side of any open space. How different that is, as you all know, from scarlet fever, in which you expect cases to develop in the same school room with other cases; in which you know your method of search for the origin of the disease is to go to the children that have been in contact with the sick children and to search there for peeling of the limbs or other evidence of scarlet fever. Infantile paralysis will show itself here, and the next case will be in an adjoining county or some far-away community.

Please note this observation: In Illinois during the past summer, in a study of 335 cases, it was found that they occurred in 146 communities. Approximately half of the cases were in one community, Chicago. But note this: 99 cases occurred in communities in which there was but one case, and 31 in communities in which there were 12 cases. What is the explanation? One case of infantile paralysis developed in the country neighborhood and the only case in the entire community, no cases developing from it, and no possibility of demonstrating the relationship between that case and any other.

Again, the age, the distribution of infantile paralysis is not indicative of contact infection. Nine cases in the Illinois investigation were under six months of age, and 22 cases between 6 and 12 months of age. In the New York epidemic 10% of the cases were under one year of age; 44% of the cases were between 2 and 4 years of age, and 76% of the cases were under 6 years of age, or 76% of the cases were under school age. Furthermore, the disease tends to end with the opening of schools, so that there is much reason for believing that it is not a disease that is due to contact infection.

Another theory is that it is due to infection from insects. Part of the Massachusetts study was made by Rosenau. They noticed in Massachusetts that it was a rural disease; that it spread along routes that horses travel rather than along routes of railroads. They concluded it must be transmitted by insects that had to do with horses, and they got some proof that it was spread by the bite of stable flies. They were able to produce the disease by letting stable flies infect monkeys and then bite susceptible monkeys. That observation was verified by Anderson, but since that time no observer has been able to sustain the conclusion, and the tendency at the present time is to believe that it is not spread by insects.

The recently-announced theory of Richardson, of Boston, that it is spread by flea bites; that fleas in turn spread it by rats, has not met any particular approval. There is much reason for believing that the disease is carried into the intestinal tract and is spread by food substances. It is a disease of the summer time. Its season is the fly season. It has the same seasonal prevalence as typhoid fever. Furthermore, it has been found occasionally that there were ulcers in the intestinal tract, and not infrequently enlarged lymph nodes in the intestines have been demonstrated. Those are the reasons why many men believe that our efforts to control this disease should be exerted along food lines rather than along contact lines in the years to come.

Now, there is a brighter side of the picture, and it is this: in the first place, I want to call your attention to the fact that in the year 1916 they have had in the City of New York the lowest baby death rate they have ever had in the history of that City. There have been more than 900 fewer deaths of babies in New York City during the year 1916 than in any previous year. In the three months when this terrible, devastating epidemic was prevailing in that community, there were practically 400 fewer deaths in babies from all causes than during the year 1915. Nineteen hundred and fifteen was their record year. In 1915 New York City had one of the lowest death rates of

any of the baby death rates of any large city on the face of the globe. What is the explanation? The explanation is that the effort which has been directed toward the control of infantile paralysis in that community during the year 1916 is carried to other diseases, and in spite of the fact that nearly 3,000 people have died from infantile paralysis, and the majority of them were children, in New York City during the year 1916 there has been a decrease in the number of deaths from all causes, and why? Because the Health Department has been more active in bringing about sanitation, in producing cleanliness, in controlling flies, in caring for the milk supply, than it has ever been before, partly because it has more men and more money than it has ever had, but in greater part because it has had more co-operation and has had more help from the people themselves than it ever had before, and that is one bright spot in that very dark picture.

Then, there is another thing they have demonstrated there: that while they have not been able to control the disease in its entirety until cold weather came on, it has been possible to control in part the epidemic focus in about six weeks, and that means that the same measures applied ought to control an epidemic in an isolated community, in a country community, in the same length of time.

Hitherto, we have held there was no help; that practically it had to run until frost came. They have demonstrated with their imperfect machinery that it is possible to control the disease in about six weeks; and now that they are at the end of this disease, we are on the verge of another season. We are here in this meeting laying our plans to the end that there may be no epidemic of infantile paralysis in 1917; and what measures shall be undertaken? In the first place, the disease must be reported; and in the second place, it must be diagnosed. Wherever possible, every case must be hospitalized; quarantine all cases and all carriers, all contacts, all those who have been in contact with the cases as well as those who have been sick, to be inaugurated and to be maintained for about six weeks. There must be mediary disinfection. I do not believe that anything is gained from terminal disinfection. What is the distinction? The distinction is this: there is far greater need for mediary than for terminal disinfection. By mediary disinfection we mean the disinfection of discharges during the course of the illness as distinguished from that disinfection which leaves everything until the illness has terminated and then assumes to wipe the slate clean by liberating some formalin or burning some sulphur.

Were I a health officer and charged with the responsibility of controlling this disease, did I feel that behind me there stood women and men depending upon me to buttress them against this specter that stalks in our land, I would place my emphasis upon the prohibition of the use of uncooked food. That is my judgment. Perhaps it is a guess, incapable of demonstration, but I think there lies a method of control that offers us much of hope, and if the responsibility for protecting the people were with me, I would do everything within my power to see to it that those people protect not only all food that was uncooked, but raw milk, raw fruits, or raw vegetables, or any other form of raw food, and into this injunction I would throw every bit of kinetic drive, every bit of determination, every bit of personal power and persuasion that lay within my power to make my people unanimously put into operation that as a method of preventing the disease.

And now, finally, what can the different groups who are represented here tonight do as their contribution toward the control of infantile paralysis? I believe that we are confronted by a duty that is essentially a duty of the American people. We have done many things in the way of health conservation and disease prevention of which we may well be proud. We have driven back from our shores cholera. I dare say there is not within the hearing of my voice one person who has personal recollection of the fact that not more than two generations ago our land was devastated by cholera, and we have rolled it back, have perpetually banished it from our shores. And if there be none of those here who remember the menace of cholera, there are certainly those present who recall how our people were constantly in dread of the menace of yellow fever. Many of you know now of the security with which we go about in our daily work

in summer time by reason of the fact that scientists and health officers have seen their duty and done it.

There are other accomplishments of which we may well be proud. Our army on the Rio Grande for five years has been absolutely free from typhoid fever by reason of the efficiency of men whose duty it is to guard public health. I learned that the First Illinois Cavalry that recently returned from the Rio Grande report that in their tenure of service of practically four months there has not developed in that command a case of veneral disease. We are proud of our accomplishments. We are proud of the fact that we went to Cuba and drove from that land the relic of the old world monarchy. We are prouder still of the fact that we went to Cuba and demonstrated that American intelligence and American efficiency could make that pest hole of yellow fever and malaria a place fit for the habitation of men. We are proud of that fact. We arrogate to ourselves a certain superiority to other people because we went to Panama, where a great nation had attempted to do a great task, and had failed,—failed because they had not planned along health lines as completely and as scientifically as they had planned along the engineering line. We went there and made it one of the healthiest spots of the world and made it possible for the black man from Tahiti and San Domingo to work in comfort and efficiency along the Chagres River. Why? Because of the capacity of American scientists, because of the efficiency of American health officers. We have arrogated to ourselves a certain possession of capacity in the control of health problems, and when certain people were struggling in the days of despair to put down typhoid fever, it was to America that the cry came to save us from the enemy that oppresses us. We stand, therefore, in the eyes of the world as a nation of accomplishments in disease prevention. Therefore, we have a duty in regard to infantile paralysis because by all the world we are regarded as the pest hole of infantile paralysis.

What are the responsibilities of the different members of our groups in relation to this disease? As practitioners of curative medicine, what can you do? You can control the key to the situation. We will control the disease if you are capable of recognizing it early and acting upon correct diagnoses. The difficulty lies in this: the majority of you have never had an opportunity to see cases of infantile paralysis. I want to call attention to the fact that in the State of Vermont in 1912, subsequent to their epidemic, the State Board of Health was given the sum of $10,000 to spend in evolving methods for controlling this disease, and how did they spend it? They spent part of it to bring laboratory workers into the State to attempt to find a method of diagnosing the disease and producing a serum for its cure. They spent part of it in bringing clinicians into the State to locate, to hunt out and ferret out the cause or causes of infantile paralysis. Then they spent another part of the money for what? To see that every man practicing medicine in the State of Vermont had an opportunity to see some cases of infantile paralysis, remembering this, that nobody is quite so much interested in competent, trained, experienced doctors in the midst of the community as the people themselves; that it is worth paying for to give these men free of expense to themselves an opportunity to learn practically about infantile paralysis. And this is the duty, as I see it, of the men who are practicing curative medicine—to avail themselves of every opportunity to learn the disease, so that when they come in contact with such cases they will be able to ferret them out, and having ferreted them out, to bring them to the attention of health authorities.

Now, what is the function of departments of health, as I see it? They have a duty outside of their duty to care for the cases as they develop. I believe it is their duty to plan to the end that better principles, better opportunities for diagnosis of infantile paralysis may be available even than those in the summer of 1916. I believe that we have come to the point where it is feasible, as a practical health department procedure, to put laboratories for the practical, clinical diagnosis of infantile paralysis at the service of all doctors of a state and in the various communities, and that I believe to be a part of their duty.

In spite of our discoveries, there are things that yet remain undiscovered. We

know comparatively little of the methods by which infantile paralysis is spread. I believe they have a duty in relation to this disease in trying to ferret out the relation between cases of infantile paralysis, the laws of spread of one case to another.

Now what is the duty of the laboratories? I trust that every one here understands that there is a relationship between the man who works in cloister, who works in a laboratory, who works isolated from the things of every day, and the work of the market place. What is the duty of the laboratory in this great co-operative work? I believe we have developed methods for practical every-day diagnosis, but we are far from having developed methods of cure that are satisfactory. The methods of diagnosis that we now have can be materially improved, but the best method we have of curing cases by the injection of serum taken from people who have recovered from the disease is far from being a practical procedure.

In New York City they advertised in the midst of their epidemic for people who had had the disease, who were willing to contribute blood serum for the cure of other cases. I learned that people came forward in great numbers, and some of those who were cured donated to the Department of Health considerable sums of money to be given to those people who were in need of it who had contributed blood serum. I heard they have had great difficulty in disposing of that money, that those who donated their blood serum insisted that they did it from the best of motives, patriotic motives, humanitarian motives, motives of fellowship and right, and that they refused to be compensated for the service they had rendered. Yet that does not alter the main fact that any therapeutic procedure that depends for the source of supply of a remedy upon the voluntary donation of people will not permanently work as a therapeutic procedure. Laboratories, therefore, are under the necessity of perhaps [illegible]g this serum and certainly of [illegible]ring some method by which it or [illegible]ier similar substance can be re[illegible] from the bodies of large animals, fo[illegible]e, horses, cows, sheep, etc. The laboratories have a duty to discharge in connection with this disease. I would not have the people understand that they are free of responsibility, for they are not free from responsibilities toward this situation. The duties can not be carried and should not be carried alone by health departments or by practicing physicians without departments, or by laboratories, practicing physicians and health departments, but the people themselves have a duty to discharge in relation to this disease, and what is that duty? It has been said that the greatest need of a democracy is not an intelligent leadership, but is rather an intelligent fellowship. There is the need that the people should understand that if their representatives are to protect them against preventable disease, they are charged with the duty of supporting these health departments not only with money, with material means, with taxation given them by governmental bodies, and other monies furnished by philanthropists, but they must support them by intelligent public sentiment; they must stand behind them and uphold them; that they must furnish the bulwark and the solid foundation upon which health departments can build and without which health departments will not build.

## THE WASSERMANN TEST IN PUBLIC HEALTH WORK*

By F. A. Coward, M.D.,
Columbia, S. C.

The writer wishes to present the following remarks upon his experience with, and trials of, the Wassermann test during the past six and one-half months, as used in the Laboratory of the South Carolina State Board of Health. The test was performed free of charge on specimens sent in from any source, the only requirement being that certain information as to the social status of patients be given. It is our opinion that the value of the Wassermann test no longer requires discussion. In public health work it has the same standing as other well-recognized tests such as those for tuberculosis, typhoid fever, hookworm, malaria, etc.

As Dr. Martin, our Chairman, stated in

*Read in Section on Public Health, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

his address, the laboratory must be the keystone of our public health system. It is the function of the laboratory to determine the nature and extent of disease, after which our other public health agencies thus informed can plan their campaign of prevention and perhaps, in the future, of cure.

It is only after knowing the extent of disease and the possibility of its prevention that we can go before business men in our legislatures and tax-payers and ask for money to be expended for public health work, acting under the doctrines laid down by Pasteur and our own Public Health Service, to the effect that it is within the power of man to cause all communicable disease to disappear from the earth, and that good health is purchasable by dollars and cents.

## BEGINNING OF THE WORK IN SOUTH CAROLINA

We were inspired to take up this work by the suggestions of numerous physicians and by the striking results accomplished by the New York Board of Health, following the technique worked out by A. McNeil for handling Wassermann tests in large numbers. Tentative proposals for taking up the work were made to our Board one year ago, and one of our Laboratory staff was sent to New York to study the methods of the New York City Board of Health. He was given every possible opportunity for making the study of their system, and was also accorded every possible courtesy by Dr. McNeil, who, at that time, had joined the staff of a private laboratory.

Owing to the misguided opposition of a private laboratory in South Carolina, it became necessary to secure the passage of an act of the Legislature requiring the performance of the tests free to all citizens; so that the actual work was not begun until April of this year.

We will say, briefly, that we believe that we are giving the members of our profession a reasonably accurate test. Since April we have done twelve hundred (1,200) tests, with approximately 25% of positives. We are prepared, without further expense, to do at most fifty tests daily, and we expect to do at least five thousand during the coming year. This is being done with a laboratory force of two men and one porter. The laboratory at the same time prepares, bottles and sends out over 300 treatments for the prevention of rabies and performs about 6,000 of the ordinary diagnostic tests.

Our initial expense for glassware, etc., was less than one hundred dollars; our largest expense directly due to the Wassermann tests was for specimen containers. These cost us approximately 20 cents each, including outgoing postage and necessary printed blanks. But, as all of these containers are returned, they can be used repeatedly and will not be a further source of expense, with the single exception of the needle, which is the cheapest part of the outfit and costs less than 1 cent, and even this could be saved if it seemed worth while.

Our expense for animals has been practically limited to the initial outlay and to feed. We get along with three sheep, two dozen guinea pigs, and two rabbits. Sheep are bled from two to three times a week. Two rabbits, immunized against sheep cells, are maintained in the Laboratory all the time. One or two guinea pigs are bled from the heart each day to furnish complement. We have lost only six pigs in six months.

Some doubts were felt in the beginning as to the character of the specimens which would be received, and as to their availability for the tests when being sent from a distance. We will simply say as to this that approximately 1% of specimens were unsuitable to use on account of hemolysis, and this during a period covering the hottest months of the year. We feel sure that after more extended use of the tests and dissemination of knowledge regarding the proper taking and sending of specimens that this figure will be reduced to a minimum. We get no hemolyzed specimens when our own containers are used according to our directions, since in that case only clear serum is sent.

## CONCLUSIONS

Our experience, we must admit, so far, is limited; but we hope that it will be of value to health workers in the other Southern states who are contemplating offering this test to their public. We believe that we are justified in submitting the following conclusions:

1. The Wassermann test can be done free by any moderately well-equipped and

manned laboratory, without notable additional expense.

2. It will soon be found by others, as it has been by us, that the dreaded disease is much more prevalent than any other persons but physicians have suspected. We have found positives in ministers of the gospel, in young unmarried women, etc. Just as the prohibition movement made no headway while it was fought along purely moral premises, and only came into its own when business men realized that sobriety was inseparable from clear thinking and efficient performance of duty, so the question of syphilis and venereal disease in general will fail to be settled while the nature of man remains as it is and we attempt to guide it and to control passions by moral precept alone. When the public realizes that syphilis is as widespread as we are showing it to be, that the innocent are the greatest sufferers, and, at the same time those least likely to be helped, since their disease is not suspected, then the public will join with us in demanding routine performance of this and other tests, and the paticular disease in question will be put in its proper place along with other communicable diseases and attacked from the standpoint of prevention and cure, rather than from the standpoint of hypocrisy and avoidance.

3. The Wassermann test has now become a public health measure, and should be extended to every one. It is not necessary to make improper use of names or social status of the patients in order to accomplish the aims of disease prevention in this or any other field of public health work.

We can say, at least, that in South Carolina any parent who allows his daughter to enter the marriage relation without assuring himself of freedom from this disease in the prospective son-in-law is very foolish to say the least, and that any man who enters the marriage relation without availing himself of the test now offered him is, at the least, a criminal. The State has done her part.

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DISCUSSION

*J. S. Leathers, University, Miss.*—It seems to me our state board laboratories play a very important part in connection with the venereal diseases than they formerly did. The Wassermann test is a matter that seems to me is of considerable importance from the standpoint of simpleness. The only point in my mind—and I would like to ask this as a question—is the value of this test from the standpoint of giving advice when it is done and the negative test is obtained. Now, if you get three negatives, some persons claim they will be confirmatory of cure; and you'll find advice given you that if you get a number of negatives there is no particular value to attach to it. There appears to be quite a difference of opinion, and it seems to me that this great difference of opinion among our laboratory men concerning the test should not convey the impression that they are necessarily cured. Take, for instance, the marriage relation. I fear very much if we use this test as a state matter we may be getting into trouble constantly unless there is a very positive result to be obtained. I mean to say, if it is negative, then it should be in reality negative and give that as advice. Of course, a positive test is usually considered clear, although it is not necessarily so, for I can remember a case of a physician in Mississippi who was treating a Negro for syphilis. Well, he sent the blood of this patient to Memphis to be tested. He also sent his own blood. Of course, there may be the possibility of having mixed the bloods, but he sent his blood at a different time but to the same laboratory, and he got a report for the Negro negative and for himself positive. Naturally, it worried him considerably for six weeks or two months. He did not know whether just to take the treatment or not, but he investigated it further and was advised possibly there was some error in the test in his particular case, and so he got along very well after that. While he was worried before that time, after that he was all right, and he has not had any trouble—that is, so far as any evidences of syphilis are concerned.

I should like for Dr. Coward to go into the question a little more fully of just what should be the attitude of the state board laboratory from the standpoint of giving advice to people relative to the Wassermann.

*Dr. Coward (closing).*—The point is, when is syphilis communicable? Now, we hope in the millennium, or perhaps a little sooner than that, to offer free treatment. That was the chief and the strongest argument made by the opposition that we had against our using the test at all, that we were simply making it and helping the doctors and not giving the help to the public at all; but I make the point it will give us a notion as to the extent of the disease.

Now, we are using a technique which gives a very low percentage of positives. It is exactly that used in New York. It won't give us positives in scarlet fever, leprosy, etc., and it won't be much of a test for private practitioners to control treatment of cases with. We miss some that should come positive. I think that covers Dr. Leathers' question about telling when a man is cured. We are not trying to do that; we are trying to find out how much syphilis there is in the State. Then we can go to the Legislature, and if some American genius works out a cheap drug for the treatment of syphilis, or we can afford in future years to buy the salvarsan, then we can perhaps branch out, but at the present time we are only trying to find out to what extent

have been justified in doing that, and that's all birth rate in one class and the increased rate we claim to do. Then you can go to your legislature and say so and so. We can tell them how much typhoid we have and tell them about other diseases, and if you are not going to make this test, the same argument can be used against making any other test. We had a bitter fight over it, and I thought it would be interesting to you men to know how we came out. As you remember, doctor, we discussed it in Dallas. Does that cover what you mean?

Dr. Leathers: Yes.

Dr. Coward: About the cure: we are not attempting that. The best argument we have was Dr. Krauss' statement when he got up in Dallas and said that any private laboratory that could not compete with underpaid health workers was not worth anything, anyhow. We are not trying to help the doctor treat syphilis; we have not taken that up. We only want to know how much of it there is.

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## *AUTHORS' ABSTRACTS*

### *Tropical Diseases and Public Health*

*Birth Control: What Shall be the Attitude of the Medical Profession Toward the Present-Day Propaganda?* George W. Kosmak, New York, N. Y. Medical Record, Vol. 91, No. 7, February 17, 1917, p. 268.

The present agitation relative to the voluntary limitation of the size of the family is a continuation of a movement developed in Europe during the last few decades, which has been participated in largely by laymen rather than physicians. Physicians, however, owe a duty to the community in taking an appropriate stand in relation to the propaganda of birth control, so-called. Those who favor the more widespread dissemination of contraceptive measures believe that poverty, crime, disease and most other social evils would disappear as soon as this could be exercised, and they have seized upon the vital statistics of certain European countries to prove their point. Although it is true that the infant mortality in these countries has declined within recent years, this is also true of other localities where no such contraceptionist's measures have been employed, and the improvement may be more justly ascribed to appropriate pre- and postnatal care, improved housing conditions, a supervised milk supply, and similar labors which have occupied the attention of lay and medical workers in the preventative field of medicine. The argument that the well-to-do are not blessed with large families because of their knowledge of contraceptive measures in contrast to the poorer classes, who are not possessed of this knowledge, is likewise a fallacy, as the reduced syphilis exists in our State, and we feel that we in the other depend upon entirely different factors. The voluntary control of pregnancy in a wide sense is practically impossible, as conception depends upon accident rather than design in most instances. Moreover, large families among the poorer class, within reasonable limits, are demanded by our economic system and any interference with the natural birth rate will soon result in a decadence that may be difficult or impossible to control.

Family limitation may be discussed from the medical, moral and legal standpoints. In many cases conception must be prevented because of tuberculosis, heart disease and other disturbances in the mother. This necessity can not be denied and the physician is now fully empowered to handle the situation. He must, however, carefully divorce his activities from any social or economic aspects that have developed from this subject and should not lend his aid and support to any propaganda which tends to inculcate in the minds of the community the necessity for artificially controlling the birth rate of the nation, the final result of which will be a deplorable one and can only reflect disparagingly upon those who have fathered this movement. The unrestricted dissemination of contraceptionist measures will also in time result in the creation of a class of irregular practitioners who will not hesitate to prescribe drugs and other appliances whenever necessary. Their knowledge, moreover, is not scientific but very faulty, and in many cases the interest of the supporters of these movements is hysterical rather than real. A change in the penal code of various states, which now prevents general dissemination of contraceptive knowledge, is regarded as a necessity by the propagandists. There is no need for such a change in so far as the physician is concerned, for the law empowers him specifically to employ whatever means he may think necessary to prevent disease, and the courts of law have decided that the physician does not violate the spirit of the law in honestly extending such knowledge and information to his patients. The moral aspects of any limitation in the restrictions now imposed by state laws will constitute a potential danger to the recipients and also result in the more widespread practice of professional abortionists, who will make their measures a part of their specialty. The medical profession is fully qualified to deal with the situation without resort to assistance of lay reformers. Education in a broad sense will contribute more to the solution of this problem than ill-advised legislative enactments and sensational propagandist movements for which no real need has as yet been shown. Too many pitfalls are associated with a movement of this kind to warrant its general adoption.

# SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

## SURGICAL CLINIC*

By Stuart McGuire, M.D.,
Richmond, Va.

The material provided for my clinic today consists of three patients, one with gall stones, one with goiter and one with duodenal ulcer. I am accustomed to operate before students and to discuss the elementary facts with reference to the etiology, pathology, symptomatology, diagnosis and treatment of disease. Therefore, I am embarrassed on the present occasion because my audience is composed of practical and experienced surgeons and I have nothing to show or to say that is new or original.

Every man works to the best advantage in familiar surroundings, and I wish the Atlanta surgeons had arranged to conduct these clinics themselves. As it is, I shall do the best I can with strange patients, strange assistants and strange instruments. I have asked that no change be made in the usual technique, as experience has taught me that when nurses have been accustomed to do the same thing in the same way day after day any change in routine is apt to cause confusion and lead to trouble.

### GALL STONES

Case I.—The first patient comes with a diagnosis of cholecystitis, probably complicated by gall stones. I shall ask that her history be read.

Female Jewess, aet. 42, occupation housekeeper.

*Chief Complaint.*—Pain and discomfort in epigastric region.

*Family History.*—Mother living and well, age 75 years. Father dead, cause unknown; had some stomach trouble. One brother living and well. One sister living and well. One sister [illegible] in infancy. No history of tuberculosis, cancer, insanity, epilepsy, or cardio-renal [illegible] in family.

Married; six children, four living, two dead, causes unknown. No miscarriages; denies leucorrhea. Denies typhoid, malaria, rheumatism and diarrhea. Had measles when a child. Had influenza during 1906 and has not had good health since. Has had frequent attacks of colic for the past 10 years. Born in Russia and lived there until seven years ago. Has lived in the United States since.

*Present Complaint.*—Dates from 1906. Began with occasional pain and discomfort in epigastric region. Vomited occasionally until 1915; has not vomited since 1915. Says that food seems to lodge or stop in her throat and gives choking sensation. Has frequent eructations of gas following each meal; often belches up small amount of greenish and bitter fluid. The pain in the stomach is not influenced by eating. Is hungry most of the time; appetite is very good. Has had a yellowish discoloration of skin for past ten years. Constipated all the time for past ten years. Complains of pain in right shoulder and right leg for the past ten years.

*Physical Examination.*—Head: Scalp and hair negative; eyes show yellowish discoloration of the conjunctiva; nose negative; teeth very bad; gums show marked pyorrhea adveolaris; tongue whitish coat; lateral cervical glands palpable. Chest: Well developed and nourished; yellowish discoloration of skin; two small scars on back; lungs clear. Heart: Area of dullness increased downward and to the left; no murmurs heard. Abdomen: Tenderness in right epigastric region; rigidity of muscles on right side of abdomen, most marked in upper right quadrant, slight tenderness in right iliac region. Extremities: Knee jerks present both sides; Babinski negative on both sides; ankle clonus negative on both sides.

You will note the patient is a fat female past forty. She is a Russian Jewess and speaks and understands English poorly. When I examined her she complained of pain wherever I touched her. You see her abdomen being prepared by painting with a solution of iodine. This is the method I have employed in my work for the last few years. I find it quick, easy and as satisfactory as any other method. While in England last summer I was interested to observe the methods in use there. Lane used iodine. Moynihan has given up iodine and gone back to Harrington's solution. Most of the large London hospitals employ an aqueous solution of picric acid because of the high cost of alcohol. Personally I have not much faith in the efficiency of any form of skin disinfection. I would be perfectly willing to take a tub bath, get on the table and have my appendix removed without further prepara-

*[illegible] Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, in Amphitheater, Atlanta Medical College.

tion provided the surgeon was a gentle and dextrous operator.

The patient is now ready and I open the abdomen by an upper right rectus incision. I pass my hand down to the pelvis and find the uterus, tubes and ovaries normal. As I withdraw my hand I hook up the cecum and bring it into the wound. The appendix shows sclerotic changes, the obliterative process beginning at the tip. There is no evidence of a Lane's kink or Jackson's veil.

I shall remove the appendix, as no clinic is complete without such procedure. No two surgeons ever do this operation exactly in the same way, but all seem to get about the same result. I tie and cut the mesentery of the appendix, crush the base and ligate it with catgut. I then place a purse string suture around the appendix, apply two forceps and cut between them. The forceps next the cecum is unlocked and the base of the appendix is seen as this ribbon of crushed tissue. It is pushed into the wall of the cecum and the purse string tied over it. I use no disinfectant on the strump and have never seen any of the bad results follow which theorists claim probable from leaving infected tissue beneath a peritoneal covering.

I now begin a systematic examination of the upper abdomen. I draw out the stomach and find it normal in shape and size. There is no induration or evidence of disease at the pylorus or in the duodenum. The pyloric opening readily permits the invagination of my finger. I return the stomach to the abdominal cavity and next palpate the pancreas. I feel no hardness or enlargement and believe it is normal.

Finally I displace viscera and introduce gauze packing so as to show the gall bladder. There are adhesions between it and adjacent structures. Its walls are thick and show evidence of inflammation. Its cavity is distended and does not readily empty on pressure. I pass two fingers into the foramen of Winslow and palpate the common duct. I find no evidence of obstruction. I introduce a trocar into the fundus of the gall bladder and empty it. I enlarge the opening and sponge out the interior. It contains no stones. I insert a rubber drainage tube which is wrapped in gauze and rubber tissue. The opening in the gall bladder is closed around it with two purse string sutures of catgut. The end of the tube is allowed to pass through the abdominal incision at the most natural position. It would be a mistake to angulate the gall bladder by pulling the tube up so as to make it come out at the upper angle of the wound. The gall bladder is not anchored to the anterior abdominal wall nor in this case is a secondary drain believed to be necessary.

While the incision is being closed I wish to say a few words about the advisability of removing the gall bladder instead of draining it in cases like the one just operated upon. When I first began the study of surgery of the gall tract, Dr. Maurice Richardson was the greatest authority in this country. He at first advocated cholecystectomy, but with increasing experience and with what I believe additional wisdom he finally adopted cholecystostomy as a routine operation. His paper entitled "Gall Stones Without Symptoms and Symptoms Without Gall Stones" and other contributions convinced me of the correctness of his views, and I have followed his technique even at the risk of being considered old-fashioned. For there are fashions in surgery just as there are in dress.

When I first visited Rochester, Minn., some fifteen years ago, the Mayos were removing a large proportion of all the gall bladders they operated upon. For some doubtless good and sufficient reason they later changed their policy and drained the majority of their cases. Now they have switched again and are taking them out. At the last meeting of the Southern Surgical Association, Dr. Chas. H. Mayo read a paper on "Cholecystectomy vs. Cholecystostomy," in which he analyzed the results of many hundred operations, and his figures showed that in his hands cholecystectomy had no greater mortality and gave greater guarantee against morbidity. Dr. J. M. T. Finney and others took issue with him and the local newspaper published the gist of the discussion under the startling headlines, "Charlie says take it out, John says leave it in."

Personally I drain about 90 % of my cases. In my experience the gall bladders that are easy and safe to remove don't need to be sacrificed and those that

need to come out are difficult and dangerous to remove. In some cases such as irremediable obstruction to the cystic duct and gangrene or cancer of the gall bladder the gall bladder should of course be removed; but in the majority of cases drainage followed by proper diet, exercise and medicinal treatment will give most satisfactory results. The objection to routine cholecystectomy are:

1. In the hands of the average surgeon it is attended by a higher mortality.
2. It fails to give drainage which many believe is an important factor in the cure of these patients.
3. It removes an organ which, while not a physiological necessity, may be a desirable luxury. Although its essential function is not established, it certainly stores bile, secretes mucus and has other purposes in the physical economy.
4. It tends to cause morbidity due to injuries inflicted upon the common duct in isolating and tying the cystic artery and duct. Some of the most difficult operations in a modern clinic are for the restoration of the common duct which has been damaged at a previous cholecystectomy.
5. It lessens the chance of benefiting a patient by a second operation if the result of the first is not satisfactory. If the gall bladder has been removed, adequate drainage can not be secured externally by a tube or internally by a cholecystenterostomy.

GOITRE

Case II.—The second patient is a case of goitre. As you see, the table upon which the patient lies is angulated so that the head is considerably higher than the foot. The object is to create a certain degree of anemia in the head and neck, thus lessening the tendency to bleed and reducing the amount of ether required to produce anesthesia, as well as to give easier access to the field of operation. Palpation of the patient's neck shows a movable tumor the size of a hen's egg in the right lobe of the thyroid. It is either a cyst or an adenoma and can doubtless be enucleated without resection of the gland. This patient has no symptoms of hyperthyroidism and her trouble is purely mechanical. The operation will therefore be safe and simple.

A collar incision is made across the neck extending as far to the left as it does to the right. This is done not only to give a good exposure for the operation, but also because a symmetrical incision gives a better cosmetic result. When this woman is well she can effectively conceal the scar that will result by a necklace or string of beads. Bleeding, which is often so troublesome in the exopthalmic type of goitre, is absent in this case and the flaps are readily dissected up and down, exposing the ribbon muscles of the neck. These are separated in the mid-line and the thyroid comes into view. As the muscles can be retracted easily, it will not be necessary to cut them. By a little effort I deliver the right lobe. The outline of the growth is very apparent. I tear through the thin capsule of glandular tissue that covers it and when the proper line of cleavage is reached it is readily peeled out. The bleeding from its bed is controlled by a continuous catgut suture. The lobe is now allowed to return to its normal position. The hemostasis seems complete, but I always drain these cases, using a folded strip of rubber tissue that adapts itself to the structures, does not become adherent and can be removed without pain. The skin incision is closed by a subcuticular suture of catgut, reinforced at several points by interrupted stitches of horse hair.

DUODENAL ULCER

Case III.—The third and last case is a man who comes with a diagnosis of duodenal ulcer. Despite the emphatic statement of Moynihan, I do not think this diagnosis can be made absolutely before operation. I often open the abdomen expecting to find ulcer of the duodenum and locate the cause of the patient's symptoms in the appendix or gall bladder.

We shall now hear the history of the patient about to be operated upon.

White male, aet. 59, American, occupation grocer.

*Chief Complaint.*—Pain over gall bladder, which radiates to left shoulder and scapula; also pain in epigastrium. On October 26, 1916, vomited blood for the second time.

*Family History.*—Father dead, senility; mother dead, cholera morbus; four sisters living and well; one sister dead, cause unknown; two brothers living.

*Past History.*—Measles, mumps, whooping cough, tonsillitis, gonorrhea and bubo 35 years ago. No other diseases; night sweats, coughs

at intervals. Lost twenty-five pounds or more. Three years ago had a slight hemorrhage from stomach. Has never been jaundiced; stools not clay colored.

*Present Illness.*—Began about three years ago, when he had a small hemorrhage from stomach. Has been suffering from indigestion at intervals since he had the hemorrhage. Has a throbbing burning pain in the epigastrium. When he takes soda it seems to relieve the pain. Pain more severe when stomach is empty. Belches sour a great deal. When he does not drink buttermilk his bowels are constipated. Movements from bowels seem to bear no relation to meals. Had a hemorrhage October 26, 1916; large amount of blood. Pain in epigastrium radiates to right nipple. Pain radiates during daytime to scapular portion; at night seems to be in epigastrium. Suffers from vertigo. Frequent nicturia.

*Physical Examination.*—Head: Alopecia. Hair gray. Ears negative. Eyes, sclera slightly jaundiced; slight arcus senilis; pupils ovoid and react sluggishly. Teeth dirty; slight pyorrhea; nose, slight deviation, catarrhal nose. Chest: Increased vocal fremitis over right lung; slight decrease of breath sounds at angle of right scapula; left lung negative. Heart: Beats full; no murmurs. Abdomen: Marked tenderness over epigastrium; slight tenderness over gall bladder; liver one finger below costal margin. Spleen not palpable. No marked rigidity. Extremities: Hands dark cedar wood appearance in color; lower left extremity negative; right lower extremity amputated at ankle joint; accident caused by street car. Right leg has also been fractured. Rectal: Has suffered with hemorrhoids.

*X-ray Series of Stomach.*—November 6, 1916. Five minutes, shows marked "filling" defect at pyloric end of stomach. Three hours, stomach completely emptied.

*Gastric Analysis.*—Quantity 5 ounces. Total acidity 60, free HCl 32.6, combined HCl 26, acid salts 1.4. No occult blood; no lactic acid.

*Urinalysis.*—Slightly cloudy straw-colored specimen. Sp. gravity 1.20, amphorteric reaction; no albumin or sugar; a trace of indol; no casts; an occasional pus cell; no blood; a few phosphatic crystals; skatol negative and total acidity 12.

*Blood Examination.*—Red cells, 3,850,000; whites, 10,800. Hemoglobin, 80 %. Small mononuclears, 20 %; polymorphonuclears, 74 %. Differential count: Large monos., 6 %; transitionals, 0; eosinophiles, 0.

I make an incision a little to the right of the mid-line from near the ensiform cartilage to the umbilicus. I hook up the cecum and inspect the appendix. It is apparently normal and I will not remove it. I pull down and turn up the liver and bring the gall bladder into plain view. There is nothing wrong with it. I palpate the pancreas with negative result.

I now draw out the transverse colon and deliver the stomach. It is not dilated as would be the case if there were pyloric obstruction. I invaginate my finger into the pylorus. The opening is normal in size, but the muscle feels hypertrophied. I feel a hard, indurated mass in the duodenum at its lower border, just distal to the pyloric vein. This I take to be an ulcer.

Some authorities claim that a gastroenterostomy does no good unless there be an obstruction. Peterson and others say, however, that the effect of the operation is not simply mechanical, and that in cases like this it effects a cure by alteration in the chemistry of the stomach. As I can find nothing else wrong, I shall perform a posterior gastroenterostomy. The transverse colon is held up and an opening is made in its meso-colon. The posterior wall of the stomach is made to bulge through this opening and a rubber-covered clamp is applied in the line of the proposed anastomosis, which is near the pylorus, directed from left to right and terminates at the lower border of the stomach. The first loop of the jejunum is found and brought up and a clamp is applied in its long axis as close as possible to its origin in order to prevent the formation of a loop. The two forceps, one containing the fold of the stomach, the other the fold of the bowel, are placed side by side and the anastomosis made with chromic catgut sutures. The cut edges of the meso-colon are stitched at several points on the stomach side of the anastomosis to prevent the possibility of a loop of small bowel's passing up into the lesser peritoneal cavity. The gauze pads will now be carefully counted by the nurse and the abdominal incision closed by the surgeons who have been kind enough to assist me.

## TREATMENT OF FRACTURES OF THE ELBOW*

By Duncan Eve, M.D.,
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Since the presentation of the report of end results of treatment of one hundred cases of "Fractures of the Elbow by Immobilization in Hyper-Flexion, Combined

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with Early Passive Movements and Massage," to the Surgical Section of the New York Academy of Medicine early in 1915 by Drs. Harold Newhoff and Heinrich F. Wolf, we have almost entirely abandoned the use of splints; however, we had used acute flexion in Jones' position for internal and external condylar fractures in young children for some years.

Jones claims that splints and bandages are responsible for the stiffness and deformity which so often result from elbow fractures, and recommends acute flexion in all fractures in or near the elbow, except those of the olecranon. He has shown that the position of acute flexion forces the fragments into place and holds them firmly between the coronoid process of the ulna, the trochlear surface of the ulna, the fascia, and the triceps tendon. Flexion is maintained by fastening a bandage around the wrist and neck. The bandage around the neck can be passed through a large rubber tube, which protects the neck from excoriations. The ball of the thumb of the fractured member should rest on the neck. The bandage can be fastened to a leather band around the wrist or to a glove, the fingers of which had best be cut off.

After the dressing has been made, certain precautions are necessary. For the first week or ten days examine the member daily. If the swelling increases or much pain is complained of, diminish the degree of flexion. Also if the radial pulse becomes weak or disappears, diminish the flexion until the circulation is normal.

To refer more specifically to this valuable contribution of Drs. Newhoff and Wolf, their report includes simple and comminuted fractures of the lower end of the humerus and upper end of the two bones of the forearm,—in fact, all types of fractures of the elbow. Out of the one hundred cases reported, only nine were adults. Dr. Wolf claims that good results from elbow fractures in adults depend more upon early movements and massage than do those in children.

The gentlemen found the best results when the fractures were immobilized for the briefest period, and when massage and passive movements were instituted early, according to the following table:

| | Perfect Result Cases | Imperfect Result Cases |
|---|---|---|
| Mobilization and massage began the first week | 27 | 2 |
| Mobilization and massage began the second week | 19 | 11 |
| Mobilization and massage began the third week | 6 | 15 |
| Mobilization and massage began the fourth week | 0 | 8 |
| Mobilization and massage began the fifth week | 1 | 11 |
| Total | 53 | 47 |

From the above tabulated cases more than one-half had perfect results. Anything short of a perfect result varied from a very small deformity to slight limitation of motion, but generally with good function.

In this country, Dr. A. P. C. Ashhurst, of Philadelphia, is given the credit of the "Hyperflexion Treatment" of fractures of the elbow, when it really belongs to Mr. Robert Jones, of Liverpool, England. However, it remained for Ashhurst to demonstrate its many advantages that were not before known and therefore we owe much to the Philadelphian. Dr. Ashhurst did not combine early passive movements and massage with hyperflexion. This was made important by Drs. Newhoff and Wolf.

It is true Lucas-Championiere, in 1895, advocated conservatism and relied upon early movement and massage as essential to success in the treatment of all fractures, and the following are his conclusions on this subject:

1. A certain amount of mobility conduces to repair.

2. Absolute fixation is often disastrous because of consequent atrophy of joint structures, tendons and muscles.

3. The more promptly resort is had to passive movement and massage, the more rapid will be the repair.

We shall only consider the fractures of the lower end of humerus and commend for your consideration hyperflexion combined with early passive movements and massage as an approved plan of treatment of elbow fractures, and will suggest some modifications in the technique as first proposed.

Hyperflexion is as potent in the control of the carrying angle as it is for leverage. The axis of the arm and forearm in hyperflexion coincide, and thus the carrying

angle is usually maintained. Experience has determined that any flexion short of hyperflexion does not prevent the lever action of the forearm. With the elbow in the acutely flexed position, the triceps acts as a natural splint of the lower end of the humerus, for again to suggest, it covers the posterior surfaces of the condyles, spreads out over the joint as an aponeurosis, and prevents rotation of the lower fragment of the humerus when reduced, especially if the line of fracture is oblique.

In fractures of the elbow there is usually considerable swelling, and this makes the early diagnosis quite difficult, and in all cases the X-ray should be used and examination with reduction made while the patient is under ether. If swelling is too great to determine a diagnosis, it is well to wait until much of the swelling can be reduced by one of the following methods:

Bandage the arm and forearm; rest it in a semi-flexed position upon a pillow; and apply evaporating lotions or even an ice bag for a day or two; or, use Gerster's plan of applying an Esmarch bandage from the hand to well above the seat of fracture, which will drive away extra-articular swelling in a day or two and permit a thorough examination and treatment.

Except in supra-condylar or transverse fracture above the condyles, reduction is best effected by drawing upon the forearm, supinating it, extending it and then bending it slowly into a position of acute flexion, the degree of flexion being in inverse ratio to the amount of swelling.

In supra-condylar fracture reduction is effected by drawing the forearm and the lower fragment downward and forward while at the same time pushing the upward fragment backward. It is possible in most instances to carry the flexion from 20 to 30° in recent fractures. Always observe the pulse.

For immobilization no splints or mechanical appliances are used, but simply a bandage or adhesive strips (sometimes both) to hold the forearm in the hyperflexed and supinated position. A piece of gauze is placed in the bend of the elbow and we prefer the Ashhurst plan of bandaging with an ordinary roller. First bandage the hand (leaving the fingers exposed), several turns are made around the wrist. The lower end of the ulna is padded and the bandage is carried from the wrist around the upper arm as near the axilla as possible, and is then brought around the wrist again. This circular turn around the forearm and arm is repeated, the turns being carried nearer and nearer the elbow. They are held in place by alternating turns passed about the elbow and the bandaging is finished by passing over the neck in order to make a sling.

When reduction has been accomplished, and the member placed in the hyperflexed position, we are in the habit of applying to the elbow adhesive strips, some eight to ten inches long and one inch wide, like Gibney's ankle sprain dressing. Especially do we think the adhesive strip support valuable in the internal condylar fracture to assist in the prevention of gunstock deformity.

The object of early passive movements and massage is to prevent joint stiffness from atrophy of muscular tissue, changes in the capsule of the joint, or mechanical interference of fragments of bone. Opponents to the use of early motion and massage think excessive callus is formed, and therefore they use this argument for the employment of immobilizing plans for longer periods. Many investigators have shown by experiments and records that excessive callus is prevented in many instances by massage and early passive movements.

In the use of this important part of the treatment I follow the advice of Newhoff and Wolf, and can not do better in describing it than to quote from their article:

"The most important principle for early mobilization and massage is that the treatment must be practically painless. The significance of this is readily grasped: well-set fragments can not be displaced without causing pain. It is, therefore, most essential that massage and mobilization be carried out under the patient's control, the slightest evidence of pain being sufficient to stop the treatment. In our hands this has proven to be the best way to avoid any accidents. If children can be sufficiently quieted to permit gentle massage near the elbow, a striking change is soon observed: the resisting and struggling child becomes quiet after a few light strokes are applied and the painful spasm of the muscles disappears; in fifteen to twenty minutes painless movements at the elbow can be practiced to a degree utterly impossible before.

"The treatments, generally of fifteen to twenty minutes' duration, consist in the beginning in

gentle, stroking massage of arm and slight flexion and extension movements at the elbow. At later periods the treatment is more and more vigorously practiced. All sudden movements of the arm are carefully avoided. The elbow is always supported during treatment and is fixed in hyperflexion after each treatment. Massage and mobilization are applied daily in the great majority of cases. Although massage may be instituted immediately after the injury, an absolute rule for the time to begin mobilization can not be made. The X-ray picture and freedom from pain in the first trials are the best guides. Mobilization may be tentatively essayed as soon as the fourth or fifth day after fracture. The earliest attempts should be made when the X-ray pictures show simple or impacted fractures, or small fragments of bone so situated that their healing in place might prove a mechanical hindrance. Active and passive motions at the shoulder and in the hand are instituted from the outset.

"The length of time that the elbow is kept in the hyperflexion bandage depends upon the union of the fracture and the type of the patient. If there is little or no pain and good function has returned to the joint, the bandage can often be omitted after some two weeks, or need be worn only at night. The dressing is rarely necessary for more than three weeks. It should be borne in mind that a lively child, finding the injured elbow free from pain, is prone to use it too carelessly and may even accidentally refracture it. In general, therefore, children require immobilization longer than adults."

All displacements which can not be reduced under anesthesia by manipulation and traction require the open operation and generally some plan of fixation.

The factors which call for operation are limitations of joint movements under an anesthetic, the presence of deformity from displacement of fragments, and the existence of excess of callus in important locations, such, for example, as the groove of the ulna nerve. The operation in such cases should consist in the removal of loose pieces of bone or the chiseling off of masses of callus. The soft parts should be carefully sutured over the raw bone to limit as far as possible fresh callus formation and the forearm placed in hyperflexion.

Stimson holds to conservative measures in the treatment of these fractures as in fractures generally and sounds a warning of the dangers of the open method of treatment. However, he admits the propriety of operative interference in certain complicated cases.

Dr. C. H. Mayo claims in fractures into or near a joint the periosteum peels up and leaves a space that a blood-clot soon occupies and becomes organized, the osteoblasts appear on the periosteum, making callus and resulting in the formation of new bone in the angle, limiting motion. He advises opening the joint and removing it just as a loose cartilage would be taken from the knee, thereby preventing free movements of the joint.

CASE REPORT

Fractures of the capitellum are rare varieties of elbow fractures and generally require operative plans of treatment for good functional results. We had a case some seven months ago that we will report and thus place on record:

W. E., male, 15 years old. Just two months previously he had sustained a fracture of his left elbow, by perhaps direct force, in being thrown from his pony. This lad was treated by a physician who noticed that the elbow was ankylosed as well as deformed, and referred the case to us.

Examination revealed that any movement of the forearm gave great pain. There was some swelling with crepitation over the radio-humeral part of the articulation even two months after the injury, especially when attempts were made to pronate and supinate the member. Very little motion in any direction could be produced, and a thickening was noticed under the upper portion of the supinator longus. An anterior angular splint had been used.

The X-ray showed an ununited fracture of the capitellum with displacement. From a lateral view the capitellum was noticed to be separated from the base of the external condyle, the line of fracture being horizontal. The fragment was rotated and hinged to its anterior margin, so that its fractured surface looked downward and backward.

On April 7, 1916, the joint was opened through Kocher's external incision and a small fragment together with some fibrous material was removed from the surface of the condyle, when the partially detached capitellum was easily turned back into place. It seemed held pretty firmly and no stitches were used. The capsule was sutured, the wound closed without drainage, and the forearm placed in hyperflexion.

The patient suffered some little for the first two days, but this gradually subsided. Union of the soft parts was primary and hyperflexion was kept up for two weeks, when the arm was lowered first to a less acute angle, then to a right angle for some two weeks longer, before the patient was allowed gently to use the member. By the first of the following June he had fairly good use of the arm, especially in the movement of flexion. He could then extend the arm to about 140°. Supination and pronation were perfect. Some five months after the operation his extension movement was better but not full, yet it will doubtless improve with time, or until his function will almost be complete.

Editor's Note.—This is the fourth of six papers on fractures read before the Railway Surgeons. The first appeared in January, the second in February and the third in March. The other two, with discussions of all, will appear in future issues.

# THE BONE GRAFT IN SURGERY*

By F. G. Hodgson, M.D., F.A.C.S.,
Atlanta, Ga.

Bone grafting has passed beyond the experimental stage and is now a well-established surgical procedure. I shall only call attention to some practical points which have proven to be of value. An autogenous graft consisting of periosteum, cortex and endosteum, aseptically obtained and transplanted in contact with living bone, will live and develop. Much has been written and many experiments performed to determine whether the graft itself lives or merely has an osteo-conductive function for the growth of new bone. But the consensus of opinion seems to be that bone cells and osteogenetic cells in a bone graft do live just as epithelial cells live in a skin graft. Evidence of this is shown by the fact that grafts have been fractured and have united by callous formation just as does a normal bone. Also bone grafts have been infected and they have formed an involucrum and sequestrum just as living bone does.

## INDICATIONS

The general indications for bone grafting as given by Murphy, Albee, McWilliams,** and others, are:

1. To produce union in ununited fractures. The inlay graft is usually the best method, much better than metal plates, for it stimulates osteogenesis.

2. To repair traumatic bone injuries or supplant fragments removed or dislodged by injuries, especially defects in the skull, face, or long bones.

3. To supply bones congenitally absent as in absence of the tibia or spina bifida, etc.

4. To replace bones destroyed by infections as oeteomyelitis, tuberculosis, lues, etc. After removing large sequestra as in the tibia, femur or humerus.

5. To replace bones removed for non-malignant neoplasms such as cysts or mildly malignant encapsulated neoplasms, as giant celled sarcoma or chondro-sarcoma.

6. To immobilize and stimulate osteogenesis in tuberculous joints, as in Albee's spine graft, etc.

7. To fix or immobilize certain relaxed joints as in infantile paralysis or congenital dislocations.

## METHODS EMPLOYED

*Heteroplasty.*—Ivory, celluloid, silver or other metal plates have been used with more or less success, and also animal bone, living, dead or decalcified, have been successfully grafted and replaced by normal bone. But this method is much less apt to succeed and is generally less satisfactory than the autografts. Celluloid plates have remained in the skull eight years or more. Animal bone is always replaced by new bone formation.

*Homoplasty.*—The use of bones from other humans either living or aseptically obtained from recent amputations or fresh cadavers, has given a certain percentage of good results, but this, too, is less satisfactory than the autograft. If a homograft must be used as in the cases of spina bifida in a very young infant, a near relative should be used, and of course should be free from any disease such as syphilis.

*Autoplasty.*—This is by far the most satisfactory method. The graft may have a pedicle, either temporary or permanent, and this is an aid in maintaining its circulation, but this method is often complicated and cumbersome. So the free graft is more generally used, and is usually perfectly satisfactory and will live and develop if properly performed.

## GENERAL PRINCIPLES

The following general principles should be observed:

1. Scrupulous Asepsis.—The technique of Lane should be closely followed. The operation should be performed without the gloved hands' coming in contact with the wound, graft, or that part of any instrument or sponge which touches the wound. Sutures should be handled with

*Read in Section on Surgery, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

**I have used very freely in preparing this paper the excellent abstract which appeared in Surg., Gyn. and Obs. January, 1916, by Clarence A. McWilliams, of New York. This article also contains a very complete bibliography of the subject, to which those interested are referred.

See also Surg., Gyn. and Obst., September, 1916, p. 301.

instruments only and knots tied with instruments. The dressings which are to be applied to the wound should be handled with instruments only. All sinuses should have been healed for several months if any were present before operation.

2. The graft should preferably be a living autograft; if not, it should be obtained from a near relative.

3. It should possess both periosteum and endosteum. Without periosteum the graft is more than apt to die.

4. Hemostasis should be as complete as possible, as hematoma formation interferes with proper nourishment of the graft.

5. The graft should come in intimate contact with living bone, preferably at both ends, for a distance of one inch or more. Periosteum should be united to periosteum when possible.

6. Absorbable material only should be used to maintain the graft in position. Kangaroo tendon or chromicized catgut are usually sufficient. All nails, screws, wires, plates, etc., should be avoided.

7. No drain should be used.

8. A motor saw is better for obtaining a graft than hammer and chisel. There is less shock, and it is more accurate.

9. The medial surface of the tibia is better than the crest because it is less compact. Also the removal of the crest of tibia may so weaken this bone as to result in a fracture. If a large graft is removed a plaster cast should be applied to the leg.

10. An inlay graft is better for ununited fractures than an intramedullary graft because periosteum comes in contact with periosteum and endosteum with endosteum.

11. Rigid immobilization should be carefully maintained from three to nine months, depending upon the function it is to perform. Any motion of the graft may interfere with the new blood vessels' growing into it.

12. A graft increases in size with func- [illegible] It may develop a well-defined peri- [illegible]m, cortex and medullary cavity.

Severe infection with extensive sup- [illegible] sults in death of the graft fol- [illegible]s extrusion. A mild infection d [illegible] arily result in death of the gr [illegible] of it may be extruded and yet [illegible] rmation result. A trans-plant may remain viable and take part in the formation of the involucrum and the sequestrum. Lewis has transplanted grafts into an infected area and found that they grew and aided in osteogenesis in spite of a mild infection. It is usually better, however, to wait until all infection has cleared up before grafting.

14. If the head of a bone, such as the femur or humerus, is fractured and dislocated, it should not be removed, but replaced and reattached.

15. In comminuted fractures, if operation is performed, bone fragments should not be removed but replaced, as they will aid in osteogenesis.

16. The bed into which the graft is to be transplanted should be prepared first and hemostasis obtained. Then the graft is secured and transplanted directly and without unnecessary delay or handling.

Grafts are taken from the tibia more frequently than from any other bone, the crest, anterior or mesial surface being used. The bone is very accessible and a graft with periosteum and endosteum is easily obtained without materially weakening the bone.

Some surgeons prefer to use the fibula. One may obtain here a very strong graft covered with periosteum on all sides if desired. The entire bone except its lower end may be removed without materially weakening the leg.

A part of a metatarsal bone with its head has been used to replace the head of the humerus. Entire metatarsals or phalanges have been taken from the foot to replace similar bones in the hand.

The astragalus has been used to replace or form a new head of the femur. Ribs have been used either with or without periosteum to obtain a flat graft, but they are not entirely satisfactory as a rule.

Portions of the sternum have been used, especially to replace defects in the skull. Dr. Abbe took a pedunculated graft of the sternum and attached it to the forearm of a patient,, then cut the pedicle from the sternum and attached the graft to the forehead to replace a nose, the graft still being attached to the forearm; when it united to the forehead it was cut loose from the arm.

Portions of the scapula and of the clavicles have also been utilized as grafts.

The crest of ilium has been used to obtain a curved graft.

TRANSPLANTATION OF EPIPHYSIS

Some experiments have recently been performed by Haas to determine whether the epiphysis continued to functionate after transplantation. He used young dogs. He removed the metatarsal bone and in some cases reimplanted it in the same place from which it was removed and in others transplanted it to the other foot.

From a series of experiments he drew the following conclusions:

1. The epiphyseal line ceased to functionate after reimplantation or auto-transplantation. Longitudinal growth of the bone ceases in every case.

2. The articular cartilage undergoes practically no changes after reimplantation. Degenerative and regenerative changes may occur in auto-transplantation.

3. The marrow of the transplant appears to undergo an early complete necrosis and gradually reforms.

Transplantation of entire joints have been performed in some cases with temporarily good or fair results. But most cases have eventually failed or given rise to an ankylosed joint. The results have as a rule been no better than resection.

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DISCUSSION

*Dr. Addison Brenizer, Charlotte, N. C.*—It is very appropriate that Dr. Hodgson has brought up the subject of bone graft, because the literature now is voluminous on the subject. The reference he makes to McWilliams' article about covers the ground. The bone graft does grow, and stimulates the incipient bone to grow. However, from the surgeon's standpoint it is enough to know that he can either stimulate the bone or the growth of the bone graft.

I think one of the proofs of the growth of the bone graft is the skull bone shows so little tendency to repair itself, and when grafted into the skull you have a beautiful condition of support and the graft seems to cover the cavity. It is necessary to have a good support for your graft, a fairly good blood supply, etc.

I worked up a little paper published in this month's *Annals of Surgery*, and it seems there are only eight cases reported in the literature, although there must be a great many more. With the conditions so favorable, it seems to me there must have been a great many more. The periosteum and the cortex are the things to be grafted and it should be an autogenous graft and not alone on account of the infection of syphilis, etc. All metal plates repel bone formation instead of doing any good.

I think I would disagree in resecting a long bone for malignant growth. I think the whole section should be removed. The bone is limited by the periosteum and the cappings at the end, and in the long bone I would prefer to remove the whole section of the bone and take the chance of having one end grafted and the other left free.

*Dr. T. R. Wright, Augusta, Ga.*—There is no subject in surgery that attracts more attention and comes more frequently under the observation of the surgeon. Necessarily, it makes it an extremely interesting one. Dr. Hodgson made several remarks that brought to mind quite a number of cases coming under my own observation. He made the statement that sometimes it was just as well when you had an ununited fracture and you had done what you could, not to put it up in a fixed apparatus.

Some few years ago there was under observation a young man who had suffered an extensive fracture of both legs. Much to my surprise and regret, when the apparatus was taken off I realized that his right femur was ununited,—one in which I had the simple fracture to deal with. It occurred to me that possibly there were some pieces of tissue left between the two ends of bone. X-ray was not at my disposal just then, so it flashed into my mind to take off the dressing and let it stay off for a week or so and see what irritation of the bones, according to old surgery, might do. It was done. I was criticised by those in the institution in which I was, and they wanted to know why I left it loose. I said: "Wait a while and let's see." It was then put up in a semi-fixed apparatus. This was again taken down in four weeks, and, much to my delight, the ununited femur was itself again.

Just a few days ago, in talking to the Section on Surgery in the institution to which I belong, a student said to me: "Why is it you don't advocate bone plates?" I said: "I do not advocate any foreign body on a broken bone." A foreign body in fractures of the skull have been done away with; the bone graft is the only essential one, or a small piece of non-irritating tissue such as was mentioned by Dr. Matas.

Now I am glad to see that it has come true, and I am glad that Dr. Hodgson speaks of the thing so strongly (and I think he should) in the case of the bone graft. There we are applying tissue to tissue,—just the kind of tissue we want to unite.

Another instance: A child had suffered an extensive injury to the left arm from an automobile accident. The bone was shorter. After being put up for four weeks it was taken down to see what the results were. As I laid it open to see how far it might be necessary to reunite these pieces of bone, I noticed an exuberant callus on both ends of the broken humerus. What to do with it for a moment I scarcely knew. I didn't want to shorten the child's arm more than I could help. Steadying both pieces with the forceps, that point was nipped off very, very carefully; then I slid this callus upward and downward—upward on the distil end and downward on the proximil end—so that it came together. The arm was then put in a fixed apparatus. It was noted a few days ago that union was taking place without any extensive opera-

tion, but simply utilizing what Nature has taught us—to bring the same kind of tissue in apposition. And that exuberant callus is going to give us a good union in that particular case.

*Dr. S. E. Millikin, Dallas, Tex.*—I am going to enter into Dr. Hodgson's discussion in his reference to Dr. Abbe's transplant in a defective nose, and my case illustrates the fact that the bone is not reabsorbed, in spite of the fact that it is not in contact with the bone. Some three years ago a young woman used an escharotic to remove an epithelial growth from the nose, destroying the cartilage. I had occasion to do a bone graft of the last phalanx of a finger. After more than three years the X-ray demonstrates that the bone is there and has not been absorbed.

*Dr. Hugh Trout, Roanoke, Va.*—When we go into the subject of bone graft we should be very careful. It opens up all lines of criticism,—not only from doctors but from the laity. Several years ago we published some experimental work on the subject of bone graft in the presence of infection. We did that to show the harm of the Lane plates and screws. We thought we showed our point pretty well, and we demonstrated that in a mild infection of a chronic type an autogenous bone graft would take in a large percentage of cases.

Shortly after the publication of that paper in *Surgery, Gynecology and Obstetrics*, we received great numbers of congratulatory letters, and we impressed people that infection is some means of producing union,—which was exactly opposite to the point we wanted to create.

Another piece of work done at the same time suggested the question, What would happen if the foreign material were placed in the dead line? That work was first started by Misenbach, of Buffalo, in 1903. He found out that if you put graphite in there you decrease the growth of bone in your long diameter. We took rabbits and dogs and inserted small loops in the epiphyseal line.

A boy twelve years old, in which we put in a Lane's plate, got a shortening of his arm. Since then we have used six cases of pegs in the humerus, in which there has been no decrease in the growth of bone in its long diameter.

I wish simply to stress the point that we should be careful about talking too much about bone grafts, because grafts and braces are being put in at the same time without trying the well-recognized methods in practice.

*Dr. Hodgson (closing).*—In regard to Dr. Brenizer's criticism about resecting these mildly malignant sarcomas, he said he would take out the entire bone. It has been found by a number of cases that this is not necessary; that if you entirely resect the growth with the encapsulated periosteum in these mildly malignant types they do not recur. I have two cases now, two years [illegible] peration, and they have not recurred. We [illegible] the growth with the periosteum, do a [illegible] the time of operation, and then [illegible] the tumor to the pathologist. If it is a [illegible] nalignant type we don't think amputation is nece[illegible]

[illegible] to stimulating osteogenesis by allowing a certain amount of motion, that is undoubtedly true in cases of delayed union. They will unite sometimes by use, with only moderately firm fixation.

I am glad Dr. Trout brought out the question of infection, and if you will remember, we did not advise bone grafting where there is infection, but said a bone graft would live in the presence of mild infection. If there is severe infection the graft will not live. This is especially true for bone grafting around the face for lower jaw defect. If there is an opening into the mouth we should not graft, but wait until the opening has entirely healed.

## SOME MEDICO-LEGAL DIFFICULTIES MET WITH BY THE RAILWAY SURGEON: HIS OBLIGATIONS; HIS REWARD*

By John L. Jelks, M.D., F.A.C.S., Memphis, Tenn.

We seem to have drifted into an age of damage suits. If a man rides, walks or flies, at work or at play, he must ever be on guard to protect his person, and more his purse, lest another he meets should prove more willing by foul means than fair to deprive him of his "trash," the result of his past and honorable labors. So, from the largest corporation down to the proud possessor of a tin "Lizzie," each must carry insurance if he expects adequate funds left in his bank.

The writer knows of one railway company of which it was said a few years ago that it had enough suits and judgments for damages against it at one time to cover its total valuation.

It is not always the railway company or corporation alone that is sued, but quite often the poor doctor conjointly therewith. Only a few days ago, a surgeon came to Memphis to consult the writer in such a case, a case in which he had treated a railway injury. He had advised the injured to accept the railway hospital service, which was declined. After a time the injured discovered, or the discovery was made by the same attending surgeon, that he had sustained a fracture of one of the spinous processes of a vertebra, and upon this basis a suit was brought against the railway company and the doctor conjointly.

This is a careful man, above the aver-

*Read before the Southern States Association of Railway Surgeons, Auxiliary of Southern Medical Association, Atlanta, Ga., Nov. 13, 1916.

age, and a splendid Christian gentleman, but he is less able to afford either a just or an unjust judgment than is a large corporation.

A lamentable fact is, that in this grand and free country of ours, if a large number of men unite their brains and purses to construct a great manufacturing plant or a great railway system, they are at once refused the milk of human kindness and sympathy, and before some juries their pleas, be they ever so just, have about as much weight and consideration as has the proverbial snow ball in the infernal regions.

Apropos of this, the author was a passenger on a car on which an accident had occurred, creating considerable excitement. From this car a woman would have alighted before it had stopped, but was restrained by another passenger. When this woman alighted she went down on one knee, producing the most minor abrasion, such as a small boy sustains without stopping his play. We dressed the knee and assured her she was not seriously injured. Let it be said here by way of parenthesis that the writer was the attending surgeon among her family and a circle of neighbors and friends, but that he never attended one of them since this case was dismissed. That afternoon he was called to see her again, at which time she alleged an injury at the site of an old fecal fistula. She was observed for four days longer, during which time her normal period appeared at the regular time. She had menstruated regularly during the preceding months, and about these matters careful inquiry was made.

So, feeling quite secure, the case was dismissed with positive assurances. She replied: "But, doctor, I want you to be my friend in a law suit against the company." The answer was: "Madam, I am not an ambulance-chasing surgeon and do not associate with ambulance-chasing lawyers, the services of one of whom I fear you have engaged." It was reported that the following day she was curetted on account of a miscarriage. The next news was that this case was in court. Among the jurymen I recognized one of our mutual friends, our patron and her neighbor. He and one of his sons had been operated upon by the writer. The woman was given $1,200 damages. A few days later this same juror came to consult us professionally. When asked why he had been party to such a fraudulent judgment, and he replied: "They are my friends and neighbors, and I thought they needed it." Whereupon he was dismissed from the office with reproaches and the plain statement that his practice was no longer desired.

The railway surgeoon is quite often called to obtain for, and give to, the company an unbiased opinion of an alleged injury, and this they must have to frame their defense. By means of this the railway surgeon may save his company thousands of dollars if he is astute and careful, and this may be the result of honest judgment of the patient, the family and attending physician, as in the case of Mrs. E. P., who was in a derailed car 250 miles from Memphis. She was brought into Memphis, where her husband had secured employment, and the writer was called by wire to see her. However, being sick, an assistant was sent, who failed to find the street number, or to report that fact. A few days later the Claim Agent appeared to present the following report:

The lady was quite ill and he had offered her husband $500 for settlement, which offer was promptly refused, the husband saying that he would not settle for less than $5,000, as he believed his wife was permanently, if not fatally, injured.

We made two visits four miles distant with an assistant, microscope, blood slides, protoscope, stethoscope, head mirror and an unbiased mind, the latter being the most important of the articles mentioned. After having spent three or four hours in this service the following facts, which have been verified, were stated:

This lady had pellagra. She had been operated upon for appendicitis in Dallas, Texas, a year previous, and no doubt she had the infection at that time (for the author thinks it is an infectious disease).

Her mother had died over a year before this alleged injury of a well-defined case of pellagra. The lady was not injured at all, and it may be added that when all these facts were made plain, and positive proof given her family, the Claim Agent very graciously gave them $75.00,

and the railway company very charitably bestowed upon this surgeon the goodly sum of $5.00, which is the smallest fee he ever charges for one office examination.

Another case in point was that of a woman who alleged that while on a Cotton Belt train she was approaching the ladies' toilet, when the train stopped suddenly, and she was thrown to the floor and severely injured. The Claim Agent had already obtained a history of this woman and found a previous and similar allegation against the Memphis Street Railway Company. We told him we were afraid to see her alone, fearing that we might get into deeper trouble for the company, and therefore requested the privilege, which was granted, of having a consultant at that time. There was exhibited in this case the most flagrant effort to deceive. There was pin-prick anesthesia over nerves and hyperesthesia so marked over other areas that her husband, in a fit of anger, protested, but the lady very kindly allowed us to proceed after we had offered to retire.

But the consultant and the writer reported this case as vicious maligning, and though the consultant's fee is usually $25.00 and upward for consultations, the circumstances previously mentioned induced him to charge a nominal fee of $10.00, which was promptly paid, and the railroad surgeon was later allowed a fee of $5.00.

We wish to add that the Chief Surgeon of this Railroad sent a copy of a letter he wrote the Claim Department, in which he protested against the small appreciation of the services of the local surgeon who had saved the Company in this and other previous cases much litigation and possibly thousands of dollars.

Another interesting case is that of a lady who alleges that she struck her leg against her suit case on the train and thereafter had noticed an increasing con- of the anterior leg surface and hering of this extremity; in fact, such ticeable to the eye, but there were al manifestations of injury. history of the same condi- r to the alleged injury. There is o a history of a previous nerv- nd it was discovered that there was a small puncture scar over the median vein at the elbow, and it is highly probable that this last-mentioned discovery may save us further worry, as we have not been permitted to make any further examination.

Another serious responsibility falls upon the railway surgeon when an injury has been sustained in the country and has been improperly handled, the wounds improperly dressed, and the case is presented to the surgeon with complications, all of which are not portrayed. The previous history of the patient may not be stated, or may be withheld for cause, as in the case of bone injury, fracture or brain concussion, where there is syphilitic or tuberculous dyscrasia. The surgeon suffers chagrin and the company perhaps loses hundreds or thousands of dollars, the injustice of which will not be known until Gabriel blows his horn.

A Negro came on account of an alleged injury. He had worked for the railroad company for three hours as truckman when the padded bar of a truck went against the middle of his thighs. He feigned ankylosis of the knee, though examination and measurements failed to show evidence of swelling or injury. He claimed he spit blood, etc. He has two sets of lawyers employed to collect damages for his injuries two examining doctors could not find.

Another Negro had a contused finger dressed and was instructed to return one or two days later. The injury was very minor. He returned in about a week, and it so happened the General Passenger Agent of the Railroad was in the writer's office, and he and the female office attendant heard the author say to him that another doctor had dressed him, which he admitted, and say to him to return to his (Negro) doctor for further dressings, as the railroad company and surgeon could not render themselves liable by removing another doctor's dressings or by dressing his finger one day and having some one else dress it the next. He was not permitted even to go into the private office, yet that Negro swore in court that he had been cursed and driven out of the office. It was fortunate that the railroad man and the lady heard every word, and these indeed were kindly spoken. But thus is the surgeon buffetted and slandered; thus is he liable to injure or have injured his

purse, person and reputation, while his labor is conscientiously and in a careful and scientific manner performed.

But all men and all women are not liars, and they are not all unjust, and at least two cases can be recalled which have been treated in which a settlement has been induced out of court, as is usually deemed best. In these cases the injured have not been adequately reimbursed for their partial but permanent injuries, their suffering and inconvenience.

In one case, not a railway injury, the astragalus was shattered and removed, both bones of the leg were broken three inches above the ankle, the periosteum was torn and stripped from the fractured ends, the os pubis was fractured and the bladder ruptured. This case was treated about six months. He walks without a stick and performs arduous tasks. The last suffering he was subjected to was a chiseling into the tibia to drain a bone abscess. This man did not sue the company to recover damages, to which he, however, was justly entitled, but told them that if they would see that the writer was paid for his services in saving his life and limb he would be satisfied. A lawyer got $100.00 for an hour's work required to recover the $500.00 the author charged for six months' work.

A railway surgeon, or any other surgeon, for that matter, would occasionally be more esteemed for cutting off a limb, as this would be less expense to the company, but the writer has always fought to the bitterest end, within a possible degree of safety for life, to save, rather than destroy, and for which cause he was recently sued for $5,000 damages by one of our blessed charities and dead beats, who had cut off a part of one of his fingers and the writer had not removed the rest of it for esthetic purposes, though he had a good stump perfectly covered, and union by first intention.

We would state with pride and pleasure that our experience with railway surgery is that, with the fees allowed, if we had enough of this work to keep us busy from morning 'till night at the present cost of living, we would be nearly able to pay our expenses, though we would not be able to incur the expense of railway and Pullman service to Atlanta and other meetings of the Southern Railway Surgeons to discuss subjects most vital to the best interest of the railroad companies and the well-meaning people.

## DISCUSSION

*Dr. Battle Malone, Memphis, Tenn.*—Most of the evils of which Dr. Jelks speaks are the results of the ambulance-chasing lawyer. I suppose this condition will exist as long as we have these lawyers and doctors willing to testify in such causes.

One thing I wish to speak of in Dr. Jelks' paper is in regard to the tendency or desire of the railroad doctor to help a just claim. I believe the doctor expressed himself as always attempting to adjust these matters out of court.

I do not think that should be done. The railroads maintain claim departments for this purpose, and I have always felt that it was not my duty to try to influence the patient in any way in making a settlement. In fact, I always refuse very positively to give the patient any advice as to what amount of money he should expect. It is, of course, our duty to tell these patients as conscientiously as we may of the permanency or temporary nature of the injury which they have sustained; but I think that we would lose a great deal of our influence with railroad people if we attempted to act as claim agents.

## RESUSCITATION OF THE NEW-BORN*

By Robt. W. Faulk, M.D.,
Monroe, La.

Statistics vary as to the number of infants who die during birth, or are lost immediately afterward. The different obstetricians estimate the number from (6.43) per cent. of infants died at the time State Board of Health in Louisiana, in 1915, six and forty-three one-hundredths (6.43%) of infants died at the time of birth. This is a terrible death rate. Why this great loss of life? It is not conforming to ideal obstetrics. Contrast the emotions, pleasurable excitement and gratification in hearing the new-born's first cry with that dismal silence and disappointment to every one when the baby is not alive. While the loss may not be a tragedy, it is tragical in nature, deep and earnest, and the man who can emphasize words already spoken, or advance a new thought, to himself proven, that will save lives which heretofore have gone to make up such heavy mortuary reports, should

*Read before Fifth District Medical Society, Ruston, La., Oct. 20, 1916.

feel that his calling has been worth while.

Hippocrates said that a fetus passed with difficulty, or that had been extracted by art, should not be separated from its mother until it had either passed urine, sneezed or cried aloud. A child not deformed should be delivered alive and uninjured. This is far from being realized.

This paper is not to consider the whole act of parturition, but the resuscitation of those infants which, for various reasons, are born in a condition of asphyxia. We use the word "asphyxia," because all authors use the term. Dr. DeLee suggests the word "anaerosis." Anaerobia means living without air, and we accept the term as more correct because a great majority of the infants in question do not breathe, but the pulse is beating and what is needed is to get the respiration started. If the reverse were true, and asphyxia existed, we have no pulse and scarcely any hope of saving the infant. Of course, sometimes the heart may come in for the brunt of battle. Then if the infant is pale or white, and the cord is not pulsating, separate immediately and tie. If the face is livid, allow a few drops of blood to flow from the cord before tying it.

Now, assuming the infant has been kept warm, manage according to the method of Prochownick. And here we would emphasize care in first cleansing the mucus from the throat, using a tracheal catheter if thought best. Suspend the feet and allow the forehead to rest lightly upon a table so as to deflex the chin and straighten the trachea. The baby is gently shaken and the chest compressed between the thumb and finger so as to squeeze out any foreign matter present in the bronchi. The chest is relaxed and the air can be heard to rush into the lungs. Very often this will suffice and the infant begin to breathe regularly, and the heart to perform its function.

Now, if the heart can not be heard with the ear or stethoscope, and the infant is limp, it is useless to make further effort; it is dead. On the other hand, if the heart can be heard, however feebly, but there are no respirations, then comes the interesting fight for life. Give hypodermatically one-three-hundredth (1-300) of a grain of strychnine sulphate. Retract the tongue with a pair of forceps and blow into the mouth, mouth-to-mouth respiration. The lung can in this way be inflated and excess of air comes out through the nostrils, cleansing the passages as can not be done in any better way. After this procedure, select your favorite form of respiration. Sylvester's may suffice. In lieu of Schulze's slinging method, the writer prefers that of Dr. G. Surghnor, of Monroe,La. This method is carried out as follows:

The physician sits with his left leg crossed over the right. The infant is seated on the right thigh with its back lying against the left thigh. The left hand, spread, receives the back of the head, while the right hand is to the front of the infant. Now, pitch the infant gently to the right hand, which receives the chest, allowing the hands and face to fall forward. A gentle toss back and the back of the infant's shoulders strikes against the left thigh of the physician, while the head is caught in the open left hand. By this means, and with every movement, air can be heard to enter and leave the lung. These infants will live so long as you use artificial respiration, but, owing to the torpor of the medulla oblongata, death results when you stop the artificial respiration.

The alkaloid strychnine sulphate is a very diffusible stimulant, and by entering the blood quickly produces marked physiological reaction upon the nervous system. The respiratory center acts and the infant breathes regularly.

The author believes that had Dr. DeLee[1] given the infant which he kept alive nine hours by the mouth-to-mouth insufflation one-three-hundredth (1-300) of a grain of strychnine sulphate hypodermatically, his efforts would have been rewarded.

We first used one-two-hundredth (1-200) of a grain of strychnine sulphate with an infant eight years past that was kept alive by artificial breathing for forty-five minutes. Dr. Surghnor was our assistant at the time and first demonstrated to us his manner of respiration; and after the strychine sulphate, breathing was marked. The infant lived. Subsequent cases showed that the dose was too much, and we have found that one-three-hundredth (1-300) of a grain produces the desired effect and without causing harm.

1. See page 809 of his work.

In cases delivered by the Cesarian section at the St. Francis Sanitarium, Monroe, La., we demonstrated the use of strychnine as above stated, using one-two-hundredth (1-200) of a grain. In every case where one-two-hundredth (1-200) of a grain was used marked physiological effects followed, proving that the dose was dangerously large, and so we now use one-three-hundredth (1-300) of a grain, and have been informed by local physicians that they have gotten similarly satisfactory results from its use.

According to statistics and estimates, there are born in Louisiana annually forty-five thousand seven hundred and twenty-five children. Again, according to statistics and estimates, of this number two thousand nine hundred and forty are still-born. By proper resuscitation methods, one-third can be saved, a saving in human life in Louisiana of nine hundred and eighty children annually.

Again, according to statistics and estimates, fifty-eight thousand and twenty-four infants are lost annually in Continental America that, by proper methods of resuscitation, can be saved.

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## *AUTHORS' ABSTRACTS*

### *Surgery, Gnecology, Obstetrics and Genito-Urinary Disease*

*Anesthesia and Acidosis.* Harold A. Sanders, New York. New York Medical Journal, January 27, 1917, p. 154.

The most troublesome complication of anesthesia is vomiting. The principal cause of postanesthetic vomiting is acid intoxication. Pre-anesthetic treatment should be aimed at prevention of the acidosis and, therefore, provides carbohydrate, alkali and water. This is best done by a pre-operative dietary of vegetables, fruits and cereals with dextrose and maltose and a minimum of meat. When possible the patient should be fed to within six hours of operation. Castor oil makes the best laxative as it produces no gas. Where enemas are required, those of sodium bicarbonate, one ounce to the quart, are most effective.

For the alkali and water elements of the treatment, give waters containing carbonates and bicarbonates of calcium, sodium and magnesium. Sodium bicarbonate and sodium citrate in one dram doses every three to four hours may be used with plain water. At the time of operation, the urine should be alkaline to litmus or rosalic acid, and the quantity at least fifty ounces in twenty-four hours.

Acidosis from fear is prevented by ten to fifteen grain doses of veronal or chloretone the night preceding the operation with morphine and atropine one hour before it. In patients who have a severe pre-existing acidosis, chloretone, veronal, and the bromides should be used and the same drugs given for post-operative pain and restlessness.

The method and kind of anesthesia should be such as to produce the minimum amount of acidosis. Persons with dilated and displaced stomachs, gall-bladder disease, intestinal obstruction and all others with pre-existing vomiting should have lavage with the bicarbonate solution before removal from the operating table. In the warm bed, he should have a retentive enema of one pint of a five per cent. solution of lactose in the bicarbonate solution. Eight ounce retentives of the same solution are given at three to four hour intervals. Quinine muriate in ten grain doses added to the first four of the enemas prevents backache and gas pains.

As soon as the patient can take liquids by mouth, sips of the sodium or calcium bicarbonate water should be given. Citrus fruit juices with sugar make them more grateful and effective. Carbohydrate feeding is carried out by the use of malted milk, cereal gruels, fruit albumin and peptonoids. When vomiting does occur, vigorous sugar alkali treatment should be pushed, and lavage with alkaline solution practiced. A powder of cocaine one-fortieth grain, menthol one-tenth grain, tincture of nux vomica one minim, bismuth sub-nitrate one grain, and cerium oxalate two grains gives relief in severe cases.

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*Trauma as a Factor in the Cause of Hydronephrosis.* Frederick C. Herrick, Cleveland, Ohio, The Cleveland Medical Journal, November, 1916, p. 704.

Uronephrosis is the preferable term for hydronephrosis, since the distended renal pelvis contains urine. Renal pelves show a very great normal variation in capacity as well as form. Capacity alone cannot be used as a criterion. Therefore, we must draw a distinction between capacity of the pelvis and one which is clinically causing trouble. A large pelvis without clinical symptoms would not be considered as pathologic. Generally speaking, a capacity above 15 c. c. will be found pathologic. It is more important to discover the smaller uronephrosis than the larger. They often cause marked symptoms over a long period of time. In those cases an early diagnosis and operation may result in saving a kidney by correction of a ptosis, severing of an accessory vessel or band of adhesions.

This paper is based upon a series of 18 cases, 7 of which were traumatic in origin. Trauma plays a very important part in the causation of uronephrosis, due to variation in the degree of lobulation and the persistence of the interlobular framework which attaches the kidney to Gerota's capsule and blends with the surrounding fascia and ligaments. A single trauma may completely tear these attachments, and render the kidney more movable. A subsequent kinking of the ureter over a band or vessel frequently results.

A very careful history must be taken in any case of suspected uronephrosis. The symptoms must be accurately described by the patient; secondly, they must be properly drawn out and correlated by the physician. By a hasty his-

tory and examination the physician fails in the case in hand and hinders the development of his own perception. Pain usually coming on in the form of colic is a very common symptom together with polyuria and hematuria. On examination tenderness over the kidney is a most constant sign. Pyelography reveals the size and shape of the pelvis. Cystoscopic examination and catheterization of the ureters is also of great value. Nephrectomy is the most plausible treatment. Pain may recur following plastic operations.

Of the eighteen cases, seven had been operated before seen on a wrong diagnosis,—three for appendicitis, one for gall bladder disease, one a nephropexy, and two tubes and appendix. Of the author's cases of nephrectomy there has been no mortality.

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*Some Surgical Considerations Concerning the Operation for Goitre.* H. B. Epstein, Newark, N. J., American Journal of Surgery, January, 1917, p. 11.

The most important question which presented itself was whether all thyroid enlargements or goiters should be removed surgically. In view of the small percentage benefited by internal medication, sera, glandular therapy, electricity, X-rays, etc., it is the author's opinion that surgical intervention is the most rational procedure.

It is a serious question whether we can restore the vascular and endocardial or myocardial integrity, even after operation, once the damage has been done by allowing hyperthyroidism to be established.

In the writer's series of cases he has always urged operation in benign enlargement of the thyroid and those patients who refused consent at that time subsequently presented themselves with Basedow's disease.

The operation for the relief of goiter calls for the following important considerations, the observance of which has largely contributed to the success attained in the modern operation for thyroidectomy.

First: The collar incision should be of sufficient length to permit a free dissection, the ample space giving the surgeon better exposure and making the procedure safer.

Second: The choice of alert assistants, for rapid hemostasis is essential. This together with speed saves the patient from unnecessarily long anesthesia, too much handing and shock.

Third: After separting the fibers of the sternothyroid muscle keep close to the gland throughout the separation. If necessary, the sterno-cleido-mastoid muscle may be cut across give better exposure to the parts, the ends sutured after the gland is removed. Care be exercised to avoid the spinal acces-

reful dissection of the posterior ders in order to avoid injury to eath or the inferior laryngeal

to expose, freely, the upper so that a safe ligatio may be generous pedicle. ' ecessary, cut the transverse layer of the deep cervical fascia. This is an important factor in reaching the superior thyroid artery and veins.

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*A Plea for the Renaissance in Plastic Gynecology.* R. E. Skeel, Cleveland, Ohio, Interstate Medical Journal, December, 1916, p. 1066.

Plastic gynecology has almost become a lost art, because its procedures are regarded as minor operations, while as a matter of fact their proper performance demands skill in the highest degree.

On the cervix the indications for operation in women of child-bearing age are laceration plus hypertrophy, erosion, and infection. Without these, laceration in young women needs no attention. After forty these indications are imperative because of the danger of malignant change and a portion of the tissue removed should always be submitted to the microscopist.

Tracholorrhaphy is hardly ever used by the author who prefers the Schroeder amputation by means of which as much or as little of the cervix as is necessary can be removed.

Secondary perineorrhaphy and anterior colporrhaphy for incomplete laceration with cystocele, rectocele, or prolapse are successful in proportion to the operator's recognition of the fact that these conditions are herniations through the pelvic floor and that the operation must narrow the orifice by restoring the vesico-vaginal plate of fascia for cystocele, and in performing perineorrhaphy uniting the two levators and their fascia anterior to the rectum, since end-to-end union of the muscle on either side with the object of restoring its normal condition is impossible.

Deep dissection between the rectal and vaginal walls is necessary to allow this suturing, and access is gained to the levators for this purpose by an extensive modification of the Tait flap-splitting operation which is shown in the illustration.

*The Importance of Accurate Diagnosis of the Urological Disturbances Encountered in Gynecological Practice.* Walter T. Dannreuther. New York, N. Y., Medical Record, January 6, 1916.

Dannreuther calls attention to the necessity for thorough investigation of all symptoms referable to the uro-genital tract occurring in gynecological patients. Even though the physician may not be competent or equipped to carry out the necessary procedures himself, he should at least be familiar with the significance of such symptoms and fully informed regarding all the modern diagnostic methods. The writer states that cystoscopy is almost invaluable to everyone doing gynecological work, and cites several cases encountered in his experience which bear out this contention. Such conditions as vesical neoplasms, uro-genital tuberculosis, calculi, etc., are not infrequently overlooked in women, because their manifestations are often meager and the gynecologist seldom pays much attention to urinary symptoms. All urinary disturbances in women are *not* due to "cystitis," nor can they all be relieved by the prescription of a urinary antiseptic and intravesical irritations. Dannreuther has also observed that the recently ad-

vocated interposition operations for the cure of uterine prolapse often have a pernicious influence on the bladder, due to the resulting distorted topography of the trigone by the underlying anteverted uterine fundus. In one case there was so much obstruction at the vesical neck that the urinary stasis occasioned the formation of a large calculus. The importance of securing a fresh, catheterized specimen of urine and a knowledge of its macroscopic appearance, the value of an estimation of the daily area output, the conclusions to be drawn from the differentiation of the various types of epithelia in the urine, and the usefulness of chromo-cystoscopy, renal function tests, radiography, and ureteral catheterism are also emphasized.

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*A Report on the Treatment of Pernicious Anemia by Transfusion and Splenectomy.* H. Z. Giffin, Rochester, Minn. The Journal of the American Medical Association, Vol. LXVIII, No. 6, February 10, 1917, p. 429.

A review of thirty-one cases of splenectomy for pernicious anemia demonstrates a definite gain in the blood, the weight and the general condition during the first three months of the post-operative period in 78 per cent. of the cases. During the second three months period, 68 per cent. of living patients maintained their gain. Two patients have maintained their gain for twelve months and three for nine months without post-operative transfusions. Five of twenty-eight patients recovering from operation have since died. Most of the cases have been of a markedly hemolytic type. The average weight of the spleens removed was 422 gm. A consideration of the advisability of splenectomy seems to be warranted chiefly in young and middle aged patients of good general resistance who show evidence of active blood destruction and in whom the blood picture does not indicate advanced pathological change in the marrow. An estimation of urobilin and urobilinogen in the duodenal contents is valuable in determining the degree of hemolytic activity present at a given time. A comparison of the degree of hemolysis with the severity of the anemia would seem to be indicative of the productive power of the bone marrow. Pre-operative treatment, especially transfusion, should be employed to influence the general condition of the patient and to improve the characteristics of the blood picture. The operative risk is increased when the hemoglobin is below 35 per cent. and the erythrocyte count less than 1,500,000 cells. There is no evidence that splenectomy has cured pernicious anemia, but there are definite indications of a consistent temporary improvement in the majority of the cases.

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*The Effect on the Jejunal Mucosa of Exposure to the Gastric Juice.* Frank C. Mann, Rochester, Minn. Journal of Medical Research, Vol. XXXV, No. 3, January, 1917, p. 289.

The purpose of the investigation was to determine the continued effect of gastric juice on an isolated portion of the jejunal mucosa, and the relation of the gastric juice to the production of gastric jejunal ulcers. The operative procedure consisted in functionally resecting a loop of the first part of the jejunum from 6 to 12 cm. in length and implanting it with intact blood supply into the posterior wall of the stomach in the region of the antrum pylori. Continuity of the intestine was maintained by anastomosis. Dogs operated upon in this manner recovered from the operation and maintained excellent health for many months. At various periods thereafter the animals were killed and a careful study of the transposed jejunum made.

The results of the investigation are based upon 14 experiments. The shortest time after operation in which a specimen was obtained was two days and the longest 330 days. In some experiments the physiologic activity of the transposed mucosa was studied in regard to fat absorption. It was found that the following changes could be noted in the transposed jejunum: there may be a slight thickening of both mucosa and muscularis; the mucus-producing cells may be increased in both number and size; and there may be active cell proliferation. In several of the experiments no change in the transposed mucosa was noted. Ulceration of the mucosa occurred in one experiment and in this case a non-absorbable suture was found in the base of the ulcer. The gastric juice is probably not the primary cause of gastro-jejunal ulcer. The function of the transplant as tested by its power to absorb fat was practically normal.

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*The Operative Treatment of Coxa Vara.* E. R. Secord, Brantford, Canada. International Journal of Surgery, Vol. XXX, No. 1, January, 1917, p. 16.

True coxa vara is defined as a non-inflammatory softening of the neck of the femur due to defective nutrition, and followed or accompanied by a yielding to pressure, and a downward bending or torsion.

The various methods of treatment by operative means that have been advocated at different times are classified, and the comment made that none of these attempts to treat the pathological condition directly, but merely to overcome the resultant deformity.

The author points out that the essentials of coxa vara are defective nutrition and downward bending of the neck of the femur. The condition thus somewhat resembles a non-united or malunited fracture of the femoral neck, in which condition the most satisfactory method of treatment is the open replacement of the fragments in their proper position, and pinning them in that position by the insertion of an autogenous bone peg through the femoral neck into the head.

Therefore, in coxa vara the downward bending should be relieved by a cuneiform osteotomy of the neck of the femur, the proper relative positions of the head and trochanter established by abduction, and maintained by the insertion of an autogenous bone peg through the neck, which by its osteogenetic activity would do much toward relieving the defective nutrition.

The author recites a case in which these principles were carried out, with details of the operative technique, and with Roentgenograms illustrating the condition before and after operation. A most satisfactory result was secured.

(Continued on page 359)

# EYE, EAR, NOSE AND THROAT

## OPHTHALMOLOGICAL CLINIC*

By E. C. Ellett, M.D.,
Memphis, Tenn.

### SENILE CATARACT

Case I.—This woman has a mature senile cataract in the right eye upon which a preliminary iridectomy has been performed. It is my custom to place a corneal suture before making the incision in cataract extraction, and then to do a simple extraction. There is less tendency to prolapse of the iris with the suture in place, and what is much more important, it makes possible a deliberate and thorough toilet of the wound, whereby all lens matter is removed. Nothing conduces to the promptness of healing and lessens the likelihood of secondary cataract like the thorough removal of the lens matter. In this case the iridectomy already has been performed, and in these cases I have found that the pressure upon the eye incident to the placing of the suture may reopen the original incision or at least cause it to permit an exudation of aqueous humor and produce an annoying edema of the tissues at the upper limbus.

I shall, therefore, omit the suture, though it would be of signal service in connection with the toilet of the wound, and proceed to make the usual peripheral section, embracing about two-fifths of the corneal circumference, and I shall also make a generous conjunctival flap. This is an advantage as an aid to prompt healing.

The capsule forceps is generally used by me to remove a piece from the center of the anterior capsule, but in this case you will see that on several attempts it failed to grasp the capsule. A toothed [illegible] would do this better, perhaps, than this one, which is the smooth-ended pattern of Kalt. A cystotome will therefore be used in the usual manner, the lens being delivered by pressure and counter-pressure. I have not the fear of the speculum that some entertain, and leave it in until the operation is finished, unless loss of vitreous humor or squeezing make its removal advisable.

You will see that there is a good deal of soft lens matter left in the pupil, and attempts to remove it by aspiration have not succeeded because my aspirator appears to be stopped up. I shall not persist in the efforts to clear up the anterior chamber as it should be, as the patient is very nervous and threatens to lose control of herself, which might be disastrous. A light dressing consisting of squares of gauze and small pads of cotton, held by adhesive, is applied and will be changed in twenty-four hours.

### CATARACT

Case II.—This patient, a Negro man, has mature cataract in the right eye. I shall use the corneal suture in this case, for reasons which I have already stated. This operation is in much favor with Prof. Kalt, of Paris, whose clinic I have visited on two occasions, the last time being in company with our distinguished Chairman. A special fine needle and silk are necessary. The suture is an in-and-out suture like Lembert's intestinal suture. The needle enters the cornea in the vertical meridian about 1 mm. within clear cornea and comes out of the cornea just at the junction of cornea and sclera. The second part of the stitch is passed transversely, just in the scleral margin, and each suture includes about 1 mm. of tissue in its bite. The suture thus forms a "T," in which an interval of half a millimeter is left between the vertical and the horizontal branches. The loop is drawn along and laid to one side, and the corneal section and other steps of the operation will be done, as you see, in the usual manner.

After the delivery of the lens the stitch is tied. The first knot is double, to prevent slipping, and is drawn tight enough to wrinkle the cornea slightly. By this means we know the edges of the wound are apposed. You must be careful not to

*Before Section on Eye, Ear, Nose and Throat, Southern [illegible] Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916 (Clinic at Atlanta Medical College).

tie the suture too tightly, as this causes the cornea to rise up on each side of the stitch, the apposition is poor, and the iris prolapse is exceedingly apt to happen. I think it is this point that one learns by experience and therefore lessens his cases of prolapse. In about 140 cases operated upon by this plan I have had 10 % of prolapse. Kalt, in his last published thousand, had 3 %.

Having tied the suture, we shall now cut the ends rather short, and with the aspirator remove all the blood and cortical matter from the pupil. You can see how it works, a regular vacuum cleaner. This aspirator consists of a silver canula, a rubber tube and a metal mouthpiece and is superior to any irrigator that I have seen used. The usual dressing will now be applied. The stitch, being non-absorbent, will be removed in 48 hours. The wound will be found closed at the first dressing tomorrow, and the patient may then sit up, and the other eye can be left open.

CATARACT

Case III.—This patient, a white man, has a mature cataract in the right eye, and he has had done on this eye a preliminary iridectomy and a McReynolds pterygium operation. I shall use the stitch in this case again to demonstrate its application. You will see that a considerable edema has appeared above the cornea, apparently due to pressure upon the eye in placing the stitch. The steps of the operation are proceeded with as usual, and following the removal of the lens the stitch is tied. You will notice how rapidly and cleanly the pupil is cleared of all debris by this aspirator, which I strongly recommend. The pillars of the coloboma being pressed back in place with a spatula, the eye is dressed in the usual manner.

In regard to the cataract operation in general, there are two things which I usually do which I would like to mention. One is the preparation by the application of White's salve (1-3,000 bichlorid of mercury in white vaseline) the night before, and then covering the eye with a gauze pad. The only objection to this is that it might interfere with the patient's sleep, as his rest is very important. I have not heard much complaint of this. The second point is the subconjunctival injection of a solution of one part of 4 % cocaine solution, one part of 1-1,000 adrenalin solution and two parts of normal salt solution (Bruns and Robin). About 5 mm. of this is injected below the cornea and a wait of eight minutes allowed before proceeding with the operation. The anesthesia is more satisfactory than when the solutions are dropped in and no injection is made.

CONGENITAL CATARACT

Case IV.—This child has a congenital cataract which will be dealt with in the usual manner by discision. The pupil is fully dilated with atropin to expose as much of the lens as possible and to get the iris out of the way. The needling is best done under general anesthesia in most cases, and the only point to which I would call attention is the advisability of entering the needle through the sclera, in front of the iris, and not through the cornea. In this location the blood supply is better than in the cornea and the puncture is made through the conjunctiva, which closes over the puncture when the needle is withdrawn. These two things tend to make infection very much less likely than if the needle is entered through the cornea.

CONVERGENT SQUINT

Case V.—This child has a convergent squint of the ordinary concomitant form, and as a comparison with the work done on similar cases by Dr. Savage and Dr. Briggs, I shall do a Reese resection operation upon the external rectus of the right eye. The first incision is a vertical cut in the conjunctiva with the scissors, over the insertion of the tendon, and extending up and down beyond the levels of the corneal margin. A nick in the capsule of Tenon permits a hook to be passed under the tendon, which is separated from the surrounding tissues. It is then grasped with tendon forceps, such as Prince's or some modification of Prince's forceps, and the tendon is divided from its attachment.

A piece of No. 5 braided silk is now threaded with two curved needles and both are passed from the bulbar side through the muscle, well back, leaving the loop of thread on the under surface of the muscle. Each needle is then passed through the conjuctiva at the temporal margin of the conjunctival wound. Two lighter su-

tures of No. 3 twisted silk are then passed through the muscle, about 2 mm. behind the heavy suture, and nearer the upper and lower margins of the muscle. These needles are passed from the conjunctival surface of the muscle to the bulbar or under side.

The muscle may now be cut behind the grasp of the tendon forceps. The effect or degree of advancement is determined by the amount of muscle excised and by the distance from the insertion that the heavy suture is passed. The stump of the tendon is now grasped with the fixation forceps exactly opposite the center of the pupil, for the double purpose of fixing the ball and of acting as a guide to the placing of the sutures the same distance above and below the corneal center.

One needle is passed through the stump of the tendon above the fixation forceps and the other below, preserving the relation they bear to each other when passed through the muscle and conjunctiva. The lighter sutures are now passed, the upper one above the stump of the tendon and the lower below, securing an anchorage in the sclera. The forceps holding, or again grasping the stump of the tendon, now rotate the eye outward and the sutures are tied. First, the two ends of the heavy sutures are tied, bringing forward the muscle to its tendon stump. The lighter sutures are then tied, their function being to spread the muscle out upon the ball in a normal manner.

The conjunctival wound is sufficiently closed without separate sutures. It is usually advisable to supplement the advancement by a free tenotomy of the internus, but you see that the immediate effect is an over-correction, and though the fact that the patient is under an anesthetic renders it difficult to judge the effect of the operation, it seems best to me to defer this and perform it later, if necessary. (To this Dr. Calhoun agreed.)

It is best to apply a binocular dressing for twenty-four hours and then the unoperated eye is uncovered. The sutures are removed in ten days. This is the operation as taught by Dr. Robert G. Reese, of the New York Eye and Ear Infirmary, and has given me better satisfaction than any other method of advancement.

## TONSIL AND ADENOID CLINIC*

By M. M. Cullom, M.D.,
Nashville, Tenn.

The chief of my instruments which I wish to show you is a mouth gag with a self-retaining tongue depressor. The mouth gag gives the maximum working space with the minimal interference with sight and hand. The tongue depressor is different from any previously attached tongue depressors in that it assists respiration instead of impeding it. All other tongue depressors are attached in the centre and crowd the tongue down upon the larynx and embarrass respiration, while this one is attached on the side and has an open space through which the tongue can rise between the end of the depressor and the teeth. The point of the depressor engages the base of the tongue and exerts a lifting effect which greatly aids respiration. The instrument has a lateral as well as a vertical adjustment which permits the alternate exposure of each tonsil. The use of the depressor also gives complete exposure of the field, and the points of visibility and accessibility add greatly to the safety of the operation. The other instruments are a tonsil dissector, a tonsil grasping forceps, a tonsil clamp and an adenotome.

The dissector has a curved double-edged knife on one end and a double-bladed, right-angled knife on the other end. It gives in one handle all the instruments needed for tonsil dissection, and enables us quickly to finish the dissection without interruption. The tonsil-grasping forceps are hinged at the end like a pair of calipers and when closed present a single arm like a rod which interferes as little as possible with sight and hand. It fulfills all the essentials of a good grasping forceps. It is slender enough so that the loop of the snare can be slipped over it and can be managed with one hand. The tonsil clamp is applied after the removal of the first tonsil and enables the operator to proceed with the removal of the second tonsil without loss of time.

The adenotome is in reality a curette

*Before Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916 (Clinic at Atlanta Medical College).

with two added features which make it to my mind the ideal instrument for the removal of adenoids. Of all instruments for the removal of adenoids the curette is the best except for two drawbacks: it sometimes strips down the mucous membrane at the back and furthermore the growth is nearly always lost. These two drawbacks are eliminated by having a flexible blade which cuts the growth at the back and a basket which catches and retains it after it has been severed.

I shall endeavor to illustrate in these operations that the safety of our patients and the perfection of our work depends upon our ability to see what we are doing. There are a number of factors which are of importance in a safe and satisfactory operation. In addition to a mouth gag with a tongue depressor that exposes the field, we must have a good headlight and we must have an anesthetic apparatus that will keep the patient quietly asleep. The Caine-McDermott apparatus is a very satisfactory one.

Case I.—This patient is a boy, aged six, with a history of tonsillitis, colds, mouth breathing and enlarged cervical glands. With a fully exposed and well illuminated field and the patient sleeping quietly, it is a matter only of a few minutes to grasp the tonsil, free it from its attachments anteriorly, superiorly and posteriorly and remove it with the snare. The use of the tonsil clamp enables us to proceed with the removal of the other tonsil without loss of time. After the tonsils are removed we carefully check every particle of hemorrhage before proceeding to the removal of the adenoids.

The patient is not allowed to leave the table until the throat is absolutely dry. There is no part of the operation which I insist upon more strongly and none from which I have derived more satisfaction than the careful checking of all hemorrhage before permitting the patient to leave the table. After-bleeding is almost unknown and the anxiety from which I used to suffer in the old days has been replaced by a feeling of security.

Case II.—The second patient is a young lady twenty-five years old with a history of tonsillitis. I shall remove her tonsils under local anesthesia. After mopping her throat three times at intervals of five minutes with an 8 % solution of cocaine I shall inject 5 c. c. of a 1 % solution of novocain to which has been added five drops of adrenalin solution. Two injections are made at the base of the tonsil, one anteriorly and one posteriorly, two in the supratonsillor region, one in the anterior pillar and one in the posterior pillar. When we are through injecting our solution we have a ring of solution ballooning up the mucous membrane all around the tonsil. The patient should have had a hypodermatic injection of one-hundredth of a grain of atropin half an hour before the operation, but in our unusual situation we overlooked it. We see the need of it now as mucus is flowing in great quantities so that it seriously interferes with our efforts. She has also evidently had a tonsillotomy performed, which also renders removal under local anesthesia more difficult on account of scar tissue.

After removing tonsils under local anesthesia it is just as important and more so to check all hemorrhage, however trifling. Unless we do so after-bleeding is apt to occur on account of the relaxation which follows the use of adrenalin.

*Author's Note.*—Five other cases were operated upon under general anesthesia. The anesthetics were administered by Dr. John R. Worley, of Dallas, Texas, and were particularly satisfactory. Dr. Worley began the anesthetic with nitrous oxid and continued it with ether vapor delivered by means of a foot pump. An ingenious suction apparatus which he himself invented removed all blood and mucus from the throat as fast as it formed.

## SOME INTERESTING CONDITIONS SEEN IN THE EYE OF A NEGRO

By Charles W. Kollock, M.D.,
Charleston, S. C.

Twenty-four years ago I read before the American Ophthalmological Society a paper entitled, "The Eye of the Negro," and twenty-three years ago I presented at the Ophthalmic Section of the Pan-American Congress, then meeting in Washington, a paper under the title "Further Observations on the Eye of the Negro."

In these papers were recorded exper-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

iences and opinions which I have thought it might be interesting to review and see if they stood the test of time. With these will be compared, and recorded, the views of Dr. H. D. Bruns, of N. O., and Dr. J. L. Minor, of Memphis, on the same subject and read by them at later dates before the American Ophthalmological Society.

In the paper read by me before the American Ophthalmological Society, in 1892, I said:

"In presenting this paper for your consideration it is not intended that any new discoveries have been made, nor that there is anything wonderful about the eye of the negro; but after a somewhat extensive experience among them it seems that some points of interest, heretofore not emphasized, might be brought more into notice, and others which have already attracted very general attention may be further elaborated and discussed."

In the paper read before the Ophthalmic Section of the Pan-American Congress, I said:

"In a former paper on this subject it was concluded that the eye of the negro had deteriorated since he became free, and that this was due to the following causes: (1) syphilitic infection; (2) the lack of good and sufficient clothing and food; (3) total disregard of sanitary and hygienic surroundings; (4) frequent sexual intercourse with the whites of low condition which has produced the mulatto, who inherits the weaknessos of both races and therefore is rarely healthy, but generally syphilitic and tuberculous; (5) education implanted upon such a rotten foundation has produced its ill effects, such as myopia and attendant evils. Syphilis has caused widespread destruction among them and it is not an exaggeration to repeat that but few remain who do not show the infection."

Bruns, in his paper before the American Opthalmological Society, in 1893, says:

"The social and economic position of the negro in the South has its effects upon the pathology of the eye. Thus injuries to the eye by foreign bodies are comparatively rare, because comparatively few of the race are artisans. On the other hand severe traumatism—brutal injuries of the whole globe by purposive violence or gross carelessness in common; and these conditions are usually presented to us in a wretched state owing to callous neglect or profound indifference. Tobacco and whisky amblyopia and its incipient manifestation, or an allied state, as a form or hemeralopia, is quite common; especially among the gangs of railroad and levee laborers, who, working far from bases of supply, are fed almost entirely on salt pork, corn bread, and potatoes, and spend most of their cash for bad tobacco and worse whisky."

By my own observations, which cover more than thirty years, and by those of Drs. Bruns and Minor, which extend over a similar period, I am in a position to reaffirm the statement then made that syphilis is a potent cause of eye affections among the negroes. I am, however, prepared to admit, in the light of recent investigations, that in all probability some affections which were attributed to syphilis may have been tuberculosis. And since we have learned that in dual infections by syphilis and tuberculosis an iritis may be caused by one or the other, it is quite natural that a mistake in diagnosis should be made as to the real cause of the inflammation under consideration. It behooves us to jack up, as it were, our diagnostic machinery to meet the times, However, such a mistake could not be very severely censured for it is more than probable that the syphilitic infection preceded that of tuberculosis and paved the way for the latter by depleting the strength of the person by weakening the resistive powers.

Drs. Bruns, Minor and I agree that for some unexplained reason the negro is less liable to catarrhal, purulent and chronic inflammations of the conjunctiva than is the white, and many observers contend that trachoma is never seen in the negro. From the reports of others though, it is quite certain that this disease is very unusual in the negro. It does occur, however, in sporadic cases, but never, as yet, has assumed an epidemic form which might naturally be expected on account of the careless conditions in which they live. Bruns says, " * * * although persons of negro blood compose only about 36 per cent. of those who attend my clinic, of all of those with conjunctival catarrh the blacks made up about 26 per cent.; of those with phlyctenular conjunctivitis about 64 per cent.; of those with purulent conjunctivitis a trifle more than 50 per cent.; of those with conjunctivitis neonatorum about 33 per cent.; of those with trachoma about 9.5 per cent.; and those with pterygium about 40 per cent. These figures permit us to say unequivocally that phlyc-

tenular conjunctivitis is *the* disease of the conjunctiva to which the negro is pre-eminently liable, and trachoma the disease from which he enjoys practical immunity.

It is the experience of those who practice among these people that corneal affections are not only more common among them than with the whites but that the results are more disastrous and that leucomata, nebulae and maculae are of very frequent occurrence. As may be expected, distorted pupils, due to prolapse of the iris, anterior and posterior adhesions, occluded pupils and consecutive cataracts are by no means uncommon. In a review of ten years service at the Shirras Dispensary in Charleston, 37 per cent. of all the eye affections in the eye of the negro were of the cornea. This experience corresponds also with that of Bruns.

In regard to cataract and glaucoma the percentage of cases seen in the negro and white are about the same. It is interesting in this connection to note that the great majority of negroes whom I have treated for cataract were uneducated and, in many instances, were unable to read and had never used their eyes for work of a trying nature; and yet we see among them as many cases of uncomplicated senile cataract as among the whites. This would not support the theory which has been generally advanced that one of the causes of cataract is eye-strain due to errors of refraction.

Bruns thinks that persons of color are more often affected by the non-inflammatory glaucoma and in a slightly larger percentage than the whites.

The occurence of optic atrophy is not only common in the negro but is becoming more so. Bruns reports 45 ∓ per cent, of optic nerve affections to be of this nature. The prevalence of syphilis among them explains a good number of these cases, and to them may be added those due to vicious modes of living, the use of alcohol and especially that which has been adulterated which is of common occurence in communities wnere liquor is difficult to procure. While I am not yet in a position to prove it, I strongly suspect that many cases of optic atrophy are due to the adulteration of liquor by wood alcohol which is easily obtained from drug stores, paint shops and similar places,

The relative occurrence of tobacco amblyopia is about the same in both races, but it is interesting to note the rather frequent occurrence of this among the negro women who smoke plug tobacco in pipes.

An especially interesting condition which is seen almost exclusively in the negro of pure blood is night blindness. This occurs quite often in connection with cases of xerosis which when complicated with kerato-malacia end in death. But there are a number of cases in which the cornea is not involved; the persons seem in fair condition and have only been brought because after sunset they begin to stumble and have difficulty in finding their way about. When tested by day the vision is usually normal and externally the eye shows no sign of trouble, The ophthalmoscope, however, reveals not infrequently a hazy, dirty-looking optic nerve in a stage of mild neuritis. A still more interesting fact is that this condition is found oftener in children than adults. A perimetric test might throw more light on this affliction for, so far as I am aware, no satisfactory explanation has been given as to the cause.

It is a well known fact that errors of refraction are not so common among the negroes as the whites, and especially is this the case with those of pure blood. Of 2,747 cases of errors of refraction reported by Bruns, only 535. or 19 per cent., were of negro blood. Of 1,074 cases of hyperopia, 20 per cent. were negroes, and of myopia there were 13 per cent. The experience of Bruns and me shows that errors of refraction are more common in negro women than men, which is accounted for by the fact that many of them are teachers and seamstresses whose work causes greater eye strain. If these investigations were confined to negroes of pure blood the percentage of refraction would be much less than reported by Bruns. Of many cases which I have examined, the great majority were hyperopic in a slight degree, while a few have had high degrees, one being 8 D. Of much less frequency among them is myopia and for many years I did not see a myopic case in the pure blooded negro.

In 1890, I reported eight cases, one of myopic astigmatism and seven of simple

myopia. Two of these were unusual, one having 12 D. and the other 16 and 18 D. respectively in the two eyes. I have but one more to add to this subject which, however, is of great interest to all—a woman, apparently of pure blood, 38 years of age and having 24 D. of myopia. She suffers from no pain nor discomfort and performs her work as cook with no complaint, except that of not seeing well. Hers were typical myopic eyes. Minor cites but two cases of myopia, one a teacher and the other a seamstress and both were mulattoes. I have kept no record of myopic cases among the mulattoes, as they are fairly common, especially with the lighter colored. Bruns' figures shows a greater percentage of myopia among negroes than mine, but his cases were persons of color, while those reported by me were all pure blacks. My record of nine cases seen in thirty years proves that in the simon pure negro myopia is still extremely rare.

In the discussion of my paper (Transactions American Ophthalmplogical Society, 1892) Dr. D. B. St. John Roosa said:

"As to myopia's being the result of civilization, I am an agnostic on that point. Until the investigations are made in the way they are now made, I do not conceive that we have data on which to form an opinion."

Dr. B. E. Fryer (Army Surgeon) reported that he had never seen a case of myopia nor strabiamus among the Indians. Dr. Swan M. Burnett said:

"That the Negro is becoming myopic with civilization is without question."

Dr. Samuel D. Riseley said:

"I rise to place myself on record a step in advance of the position assumed by Dr. Roosa. I cannot say that I am an agnostic on the relations of the myopic eye to civilization. While unquestionably true that myopia is a concomitant of civilized life, it is not necessary to one's civilization, and, therefore, not one of the results of which we can boast with pride. It is an evil consequence of our complex necessities, and it falls unlike on the student in our colleges, the seamstress and the artisan. We cannot retreat from the teaching of Donders. Myopia is a disease, and, like certain other forms of disease, is one of the results of civilization; but like them, to [illegible] by the application of broader knowledge. When we reach the ideal management of the eye in civilized life we shall prevent it, except in the extremely rare cases of congenital near sight, by better hygienic conditions, and by the correction of congenital malformations of the globe by optical means before the strain of school life is undertaken, and thus avoid the pathological conditions upon which it depends."

Dr. E. Oliver Belt, in a paper read before the Pan-American Congress, in 1893, said in conclusion:

"* * * the few cases of abnormal eyes found among the colored pupils, as compared with tne white, indicate that the influence of more advanced civilization is the causation of defective eyes. Especially is this so of astigmatism, which was found in 0.25 per cent. of the white and only in 0.10 per cent. of the colored pupils. Heredity also has much to do with it. Myopes should not marry myopes, and parents with eye trouble should especially be careful to see that their children's eyes have proper attention in order that they may avoid the development of the same defects."

Dr. Peter D. Keyser said, in discussing that phase of my paper read before the Pan-American Congress, in 1893, which dealt with myopia in the negro:

"* * * but to the remarks of Dr. Kollock in relation to the negro's never having myopia I must say that there must be a difference in the eyes of the black race in the South from those in the North, although our confreres of the South have much greater advantage in seeing more eyes of the negro than in the North. In my experience of more than twenty years in the Wills Eye Hospital, of Philadephia, I have found several that we call pure negroes suffering with well-marked myopia as well as compound myopia astigmatism. * * * Really, in my experience I find as the negroes are being educated to read that their attention is being called to the defect in vision and they seek assistance; and in proportion as these educated persons come to my clinic I find almost an equal defect as in the white,"

It is natural to infer that where refractive errors are uncommon, anomalies of the extrinsic muscles are rare; and such is the case with the black. Burnett (S. M.) considered strabismus of great rarity among negroes, while, in 1892, Russel Murdoch reported a recent operation for strabismus on a pure blooded negro.

As yet I have seen but one case of uncomplicated strabismus in a pure negro. By uncomplicated is meant that no abnormal conditions caused by disease or injury existed. The case referred to has been reported by me and was of such interest to Dr. Francis Valk, of New York, that he requested permission to use the pictures

of the boy as frontispiece of his book, "Strabismus or Squint." Of this case Dr, Valk says:

"In considering the cause of the squint some years ago I doubted if the illiterate races could have squint of the second class, that is, squint in which hyperopia might be the cause. It occurred to me that all squint of these ignorant people, who seldom use the visual power at the near point, must have amblyopia or squint of the first class, as hypermetropes, who seldom call into action the accommodation and convergence, could not have any tendency to squint unless there were some other cause. On a visit to Charleston, S. C., in the summer of 1902, Dr. Kollock, of that city, gave me the photographs of the individual shown in the frontispiece of this book, stating that the boy had been operated upon and that it was a complete failure. (The operation was not performed by the writer.) Now this case fully illustrates squint of the second class in an ignorant farm hand who has never used the eyes at a near point—except to look for a watermelon—and yet it is evident that the vision is normal in each eye with a decided squint of the alternating variety. Had this case been considered in reference to the muscular condition, in which the evidence of the weakness of the externi is apparent, and had a shortening or an advancement been performed on both externi, and then a tenotomy, if needed, his squint would have been corrected with probably binocular vision."

Briefly, the history was as follows: a negro of 12 years of age had an alternating squint. Vision in each eye was 20-20 and under the influence of atropine with plus 2 D. was 20-20. I prescribed glasses for constant wear but he passed into the hands of another who divided the interni without any resulting improvement.

Finally, I would add that the eye of the pure blooded negro is, with one exception, practically in the same condition as it was when my first report was made in 1892. The exception is that myopia is very gradually increasing.

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## DISCUSSION

*Dr. T. J. Dimitry, New Orleans, La.*—One thing that was of special interest to me was the fact that Dr. Kolloch has quoted Bruns, of New Orleans, who has done much meritorious work on this subject. The latter has accumulated well-taken histories and clinical facts for the last thirty or forty years, and it is with pride that he has amassed this data, which serves for such excellent statistical purposes.

These figures appear in the Annual Report of the Eye, Ear, Nose and Throat Hospital, of New Orleans. This data on the Negro, I believe, for years to come will serve as valuable assistance in working up interesting conditions in that [illegible].

Dr. Robin, of New Orleans, takes pride in carrying on his desk a picture of a cross-eyed Negro of the Simon-pure type.

One objection I noticed in the doctor's paper was that he did not seem to note an unusual number of cases of simple glaucoma in the Negro race. It is very common,—extremely common among them,—so much so that when we meet with a Negro woman of 45 or thereabouts who happens to be complaining of not seeing well, it is the optic nerve with an excavation that is most carefully searched for. Iridectomy seems to hasten the condition, and our literature verifies this observation.

It is pleasing to note that he took up the condition of phlyctenula ophthalmalmia. I had an opportunity to examine some 500 such cases, searching for the tuberculous cause. These patients were examined thoroughly from a tuberculous standpoint. We felt that we would easily prove it was tuberculous, but our figures failed to confirm this suspicion. The proof seems to have been in the opposite direction.

*Dr. A. L. Whitmire, New Orleans, La.*—I would like to ask Dr. Kolloch if this patient (showing photo) had his nose examined.

*Dr. G. C. Savage, Nashville, Tenn.*—I shall just base what I have to say on the two pictures of the one Negro, and I do it simply as a warning to all of you who may have cases like this. When there is any strabismus with fairly good vision in the squinting eye always *suspect* antipathy to binocular single vision. Then, the other thing I want to say is that when you have a case of antipathy to binocular single vision, you cannot possibly correct the deviation. Attempts to do so may turn the eye in the other direction; or, if you get them almost parallel, the worst thing will happen, and that will be troublesome diplopia. Be cautious in dealing with your cases of squint, where one eye is not blind from mental suppression. I always rejoice when I have a case of squint in which one eye sees poorly or none at all.

A squinting eye, where there is not antipathy to the single vision, is an eye that is always low in vision. The blindness is due to mental suppression. It begins in infancy and continues on through childhood, and the eye becomes blind, and yet it is not blind. The mind is blind,—that is all there is to that. And whenever that is the case, you may be sure that the eyes have common brain-cell connection, and then you can go ahead and do the operation, getting splendid results cosmetically, and a chance for seeing singly with the two eyes.

The best illustration I can give you is to be obtained from the street car. Two passengers are sitting on opposite sides of the car, each wanting to get off at the same corner; both touch the button at the same time; only one bell rings. There is a double impression, but a single sound. This represents a pair of eyes with common brain-cell connections—double impressions, but only one sensation. But suppose that my bell is at one end of the car, and the bell connected with the other button is at the other end. When I touch the button my bell rings, and when the other man touches his button the other bell rings. Here then are double impressions and each excites its own bell. This represents eyes that have not common brain-cell

connections, hence double impressions with double sensations which cannot be fused into one sensation. In cases of antipathy to binocular single vision, the macula of one eye is connected with visual cells in one side of the brain, while the macula in the other eye is connected with cells in the other side of the brain.

*Dr. Flavel B. Tiffany, Kansas City, Mo.*—I would like to ask if the doctor has noticed specially the eye-frame of the Negro,—that peculiar chocolate color,—and if he has, how he accounts for that; whether it is like all pigment cases; whether that gets somewhat larger in approaching glaucoma? I think it is considered that perhaps the Negro is more likely to have glaucoma than we.

*Dr. F. P. Calhoun, Atlanta, Ga.*—Two very common diseases exist among Negro patients in my clinical practice, viz., chronic iritis and Saemisch or spring catarrh. The first, of course, is of luetic origin in a large percentage of cases, and, as to the second, we have never been able to satisfy ourselves why the Negro should be so susceptible to it. In regard to the prevalence of amblyopia in the Negro due to alcohol and tobacco, my experience has been just opposite to that of Dr. Kolloch. I cannot now recall a single case of it.

*Dr. Kolloch* (closing).—In reply to the question as to whether or not the nose of this patient had been examined, I am under the impression that it had, but it has been quite a number of years since I saw him. Judging from the photograph and from the fact that the nose of the pure-blooded Negro is more open, and less liable to trouble than the white, I think it may be safely said that it was in a normal condition.

In reply to Dr. Tiffany's question, I believe the color of the eye ground is due to the pigment, and do not believe the Negro is more liable to glaucoma than the white.

As to what Dr. Savage said, having known Dr. Savage a great many years, and having great respect for his views, when I examined this patient and found the alternating squint, with good vision, I remembered his dictum and did not operate, but gave him glasses.

## THE MODERN PLAGUE*

By Thos. W. Davis, M.D.,
Winston-Salem, N. C.

The interested observer does not require a detailed efficiency test to arrive at the conclusion that there is something radically wrong with the physical man of today, speaking concretely. The evidence on the surface in a day's experience with the mass of humanity is that of an unwarranted amount of decrepitude. Too many people are anemic, neuralgic, neurasthenic, [illegible] suffers from some form of indigestion, are incapacitated for life's work and pleasure, and are grown old and ugly and diseased at a surprisingly early age. How do we account for this? I should say that elementally, body nutrition is lacking, or if body strength is normally supplied, there is an undue loss of, or prey upon, that strength. I am positive with reference to the prey upon the body strength, and wish to reiterate the opening sentence of a former paper of mine, which is as follows: "On a parallel with parasitic blight of vegetable life is bacterial blight of the human body. The scrub oak and the insect-ridden fruit tree whose production is nil, one-half or one-third of what it should be, has its counterpart in the human being of the neurasthenic, neuralgic, rheumatic, and chronic faulty digestive type.

We have been convinced time after time by macro- and micro-scopical examination that the organisms of this human blight are the usual pyogenic or pus germs, staphylococci and streptococci. They are the common and avowed enemy of mankind. The fight in open battle is that of acute inflammation or abscess (so peculiarly is it his own that I will say man is the sponsor for suppurative inflammation). If perchance Nature or the surgeon (by ventilation and drainage) or both aid man at this time to overcome the enemy, the fight is by no means ended; only the character of the warfare is different, and here the enemy puts in his most telling work. Hidden away in some pocket or crypt usually about the mouth or throat, as likely it has been for years, unnoticed by the victim because there is no pain, these organisms operate a poison factory. Every hour of the twenty-four a little poison goes into the circulation of the individual, the ultimate result of which is to undermine body-strength and lower resistance. With this advantage gained, the renewed attack by the same enemy, it may be at some vital point as in the abdomen or cranial cavity, or instead of a purely pyogenic infection, the pus germ in the form of a complication may act as ally to some other branch of the germ family.

In connection with chronic pyogenic infection I want to mention and call attention to certain pertinent facts, one of these being the vulnerability of the mouth and throat, since all germ-laden material

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passes this way. Barring the venereal and traumatic routes there is practically none other for entrance of infection into the body. Again the pus germs being largely anaerobic and requiring to be somewhat shut in, find ideal lodging places around the teeth just beneath the gum margin, and in the crypts of, and spaces around, the faucial tonsils. There is something sinister and insidious about this passive or semi-active germ life. It is not necessary that there be bleeding, loose teeth, and carious bone in order to have a pus infection in the mouth; nor is it necessary that there be pain, swelling, etc., in connection with a pyogenic infection of the tonsils. A puffiness, purplish discoloration and slight retraction of the gums is the visual evidence that mouth infection exists. Owing to their close continuity it must be a rare instance in which either mouth or throat is involved and not both.

Concerning the effect of chronic pyogenic infection there are five heads under which the subject may well be considered:

1. Local.
2. General.
3. In relation to, and influence, upon other diseases.
4. As affecting the longevity, efficiency and morals of man.
5. As concerning a quotation from Louis Pasteur: "It lies within the power of every man to rid himself of every parasitic disease."

1. Local Effect.—The invasion by the pyogenic organisms brings about first in the part that pathological state which we term congestion, which varies in degree, but which is always marked by the same changes, namely, dilatation of small blood vessels, cell migration, and transudation of the liquor sanguinis. If this process is kept up, that is becomes chronic, there results a new connective tissue formation, which displaces the normal tissue. Suppose that this process begins (as I believe it does in 99 % of cases) in the mouth and faucial region. By continuity of surface we would consider it logical and probable that the entire mucous linings of the head and upper respiratory tract would ultimately be involved. Hence, hypertrophic rhinitis, hypertrophied turbinates, chronic sinusitis, thickening of the mucous lining of the middle ear, and chronic catarrhal deafness, chronic pharyngitis, laryngitis, bronchitis, and so on.

"Recurrent cold," as commonly called, is only a certain active manifestation of an already existing passive pyogenic infection in the head. Each such exacerbation adds to the chronicity of the diseased mucous membrane. "Taking cold" is a warning and warranty enough for any individual's having the head cleared of fixed areas of pus-germ infection. This is better done before the fuse to the bomb is lighted, which means acute inflammation and abscess somewhere in the throat, accessory nasal sinuses, middle ear, or it may be at some remote point as in the abdomen.

Rosenow[1] says: "The focus of infection is to be looked on not only as the place of entrance of the bacteria, but also the place where the organisms acquire the peculiar property to infect; and that these foci are so common in patients suffering from arthritis, neuritis, appendicitis, ulcer of the stomach and cholecystitis, goitre, etc., and so rare in individuals who have had superb health for years, that their direct etiologic role can scarcely be questioned."

C. H. Mayo[2] says: "The old idiopathic osteomyelitis of the child we now know may follow a short time after a specific tonsillitis."

Billings[3] mentions malignant endocarditis in connection with alveolar focal infection, and a number of observers connect thyroid involvement with tonsil infection.

Aside from the feature of prevention and safety one may be saved (from a purely local interpretation of effect) much inconvenience and annoyance that arises from secretion, interference with breathing, hoarseness, cough, asthmatic attacks, etc., by taking care that this kind of infection has not gained and does not gain lodgment in the head.

2. General Effect.—Whatever the toxin produced by the pus-germs may be, we know that a sufficient dose in the circulation causes decided constitutional disturbance; the individual is ill, there is an acute state, an acute sepsis. Now, what

1. Jour. A. M. A., Vol. lxiii, No. 23, p. 2027.
2. Jour. A. M. A., Vol. lxiii, No. 23, p. 2026.
3. Jour. A. M. A., Vol. lxiii, No. 23, p. 2024.

of the sub-acute or passive state, when the area of infection is in the mouth or throat, where, owing to the character of the tissue, absorption is rapid. Most assuredly in varying amounts and continuously absorption is taking place. The effect of this absorption, I should say, is to produce primarily an anemia, and that the one most baneful effect of the anemia is to produce muscular weakness, especially of the unstriped variety. It is interesting to note where this kind of muscle (called muscle of organic life) is found and to quote its location from Gray's Anatomy as follows:

"In the walls of the hollow viscera, namely, the lower half of the oesophagus, and whole of the remainder of the gastro-intestinal tube; in the trachea, bronchi, alveoli and infundibula of the lungs; in the large ducts of salivary and pancreatic glands; in the pelvis of the kidney, ureter, bladder and urethra; in the sexual organs, both male and female; in the prostate gland; in the mucous membrane and skin; in the arteries, veins and lymphatics; in the iris and ciliary muscle."

Give careful thought to these structures and one readily appreciates the gravity and seriousness of the situation in case of their weakness and failure; especially is this true of the stomach and intestines, for long before reaching the stage of actual gastrop- and enterop-tosis there is impaired digestion, constipation and autointoxication. So that in addition to the germ-produced poison which enters his circulation, the individual, handicapped by checked nutrition, is also poisoning himself through a process of faulty digestion.

The disease and abnormal conditions coming directly, or indirectly, in consequence of this state of affairs are too numerous to catalogue here. Those of greatest gravity are from changes brought about in the kidney, blood vessels and heart. I have observed time after time cases of nephritis and high blood pressure in individuals, women whose habits were exemplary and in whom the only possible reason for the organic disease lay in a long-continued pyogenic infection of [illegible] and throat. With an area of this infection in the body there is always the possibility of involvement of the endothelial linings of heart (endocarditis) and joints (synovitis). To the effects of the toxemia may be added at any time those of a bacteremia.

Symptoms and conditions a part of, or independent of organic change, that are very common and of toxic manifestation, are neuritis, neuralgic and rheumatic pains of all kinds, insomnia, neurasthenia, melancholia, etc.

From my observation complaints most common which are dependent upon myasthenia (unstriped muscle) are indigestion, constipation, disturbance of the vision (through weakness of accommodation and convergence); and here I wish to say that troublesome minor refractive errors often cease to give annoyance and seem to correct themselves automatically when the infection is removed and muscle tone returns.

In those chronic conditions of the respiratory tract such as asthma and chronic bronchitis in which a stasis and weakness of the tubal muscle walls is so manifest, I have seen marked improvement after treatment by removal of areas of chronic pyogenic infection.

In two rather unique cases—two young women in which there was a very annoying symptom from weakness of the sphincter of the urinary bladder—report of entire relief was made three months after the removal of infected tonsils.

The clinical evidence is undoubtedly that the general effect of chronic pyogenic infection is most serious, as it affects the strength of this most important tissue, the muscle of organic life.

3. The Relation to and Influence Upon Other Diseases.—The element of susceptibility to all disease, in a body below par in vitality and resistance, can be put down as axiomatic. It is an equal truth that the local condition of congestion of the head, throat and respiratory tract from chronic pyogenic infection is one *par excellence* for the invasion of certain diseases (having initial lesion in those parts), notably diphtheria, scarlet fever, tuberculosis and pneumonia.

Is there any truth or significance to us in the investigation and report of Mallory and Medlar, of the Pathological Laboratory of the Boston City Hospital, to the effect that the organism of scarlet fever soon spends itself after the second or third day and that the real damage done is by the streptococcus for which it, the scarlet fever organism, opens the way and favors its growth? If so, it would seem to me

that an already existing septic throat has a most important bearing in reference to scarlet fever.

A pulmonary tuberculosis is rarely noticed until complicated by pyogenic infection; and microscopic examination is rarely made until the sputum is half pus. Isn't it the sepsis of pyogenic origin in pulmonary tubeculosis that kills, anyway? It seems to me folly to treat tuberculosis without an uncompromising effort to remove every area of chronic pyogenic infection in the body.

The pathology produced by the pus organism is the pathology of inflammation, it matters not whether in the gall bladder, appendix, kidney or pelvis. It is not difficult to see the relation between, nor is it far-fetched to presuppose the transference of infection from one location in the body to another—for example, from a chronic focus in the head to some new focus a part of, or adjacent to, the digestive tract, especially if the condition of constipation and stasis as a general result of the chronic infection invites the invasion, and it leads me to say that immunity from abdominal inflammation is largely a question of the absence of any fixed area of chronic pyogenic infection in the body. When we consider the influence upon, the prevalence of, and mortality from, infectious disease through lowered body vitality and resistance, and the difficulty in the way of recovery, once the disease is contracted, we can refer to the life of the staphylococci and streptococci in its relations to man in no other way than that of "The Great Modern Plague."

4. Affecting the Longevity, Efficiency and Morals of Man.—Shortly before his death Metchnikoff is quoted as having said:

> "The micro-organisms inhabiting our bodies have set going there a poison factory, which cuts short our existence, and by secreting poisons which penetrate all our tissues, injures all of our most precious organs, our arteries, brain, liver and kidneys."

It is natural that there come in the course of life a period when a certain failure of strength is manifest; in other words, a passing of the meridian and the beginning of the end which is ultimately absolute dissolution of the body, and death. But are we not reaching that period unnaturally early in life — around forty, when the average man begins by showing that most fatal of failures, a failing muscle strength, as is apparent in the pendulous abdomen, presbyopia, etc.?

If not bringing about death directly or indirectly by disease, I believe that, so universal is the chronic pyogenic infection in its parasitic phase, that it is unquestionably the main factor in placing the present limit on what is considered the natural life of man, and while so doing it can be and is a great menace to man's efficiency—physical, mental and moral. So inter-related and inter-dependent are these parts in man's being that serious lack in physical efficiency must show itself in untoward effects upon the mind and morals, and until a better physical status is gained, excuse must be made for bad and near-bad habits, which habits are the offspring of physical degeneracy, and further foster that degeneracy. Those people of the nerve exhaustion type will continue to seek temporary relief from pain in drugs and temporary strength to meet the demands of the day in artificial stimulants. In an intelligent and concerted effort to rid man of the parasitic micro-organisms, I think I see the possibility of lifting the curtain on "The Passing Follies"—chewing gum and pepsin for foul breath and indigestion, cosmetics and paints, patent medicines for all ills, dope drinks and the rubbers away of pain, those star performers in "The Comedy of Errors," Doctor Osteo, Doctor Chiro, and Doctor Tyro.

5. "It is within the power of every man to rid himself of every parasitic disease."—Louis Pasteur. This is no doubt a great truth and will apply provided man has sufficient enlightenment, the proper sense of self-preservation, and that the obstacle of poverty is not too great. Ridding man's body of the pus-germs is essentially a matter of public health, for, considered from the standpoint of influence on man's welfare and the mortality rate, it ranks in importance ahead of all features of public health work, not excepting typhoid fever, tuberculosis, hookworm disease, etc. No class is exempt from chronic pyogenic infection, but the prevalence and extent to which it exists among the laboring class is fearful. So sly and sinister are these organisms in diverting attention to other germ life, and shifting the responsibility for fatalities, that there

has been practically no public health measures directed against them. However, for results much depends upon the individual's attitude and effort in regard to personal hygiene and the regulation of habits.

General measures must look to (a) better body nutrition, giving the tissues a resistance to germ life; and (b) prophylaxis, to guard against one individual's infecting another, and especially should we guard against parents and nurses' infecting children. The only possible way of doing this is to rid the older people of the infection and thus remove the source. This brings me to speak of (c) the active treatment, which must be done by the medical and dental professions, in which the requirements to be met are ventilation, drainage, the possible application of germicidal agents, and the removal of chronically infected tissue. Does the removal of the faucial tonsil affect the body economy, and if so, in what way? I have never noticed anything but good results from the removal of chronically infected tonsils, in all ages from three to sixty-five years. Possible remote effects, I think, can hardly be judged at this time, since the operation of tonsillectomy is comparatively recent.

As touching every branch of the practice of medicine in effect, I believe it to be the duty of every physician to satisfy himself that each patient treated does not carry in his body a fixed area of chronic pyogenic infection. Because, as previously mentioned, the head is especially vulnerable and as this is the field of work of this Section (Eye, Ear, Nose and Throat), I feel that on this fact I may base an apology for presenting a paper so general in character, hoping that an interest may thus be stimulated in this very important subject.

## DISCUSSION

*Dr. J. B. Greene, Asheville, N. C.*—I know of no department of medicine where focal infections are more important than those arising from the ear, nose and throat. To internists like Bill[illegible] Osler and Barker, who have stressed the importance of systemic diseases arising from [illegible] infections, we owe a debt of gratitude. It seems to me also that dentistry is also a department which needs some consideration from us. In adults particularly are the foci of infection apt to be in or around infected roots of teeth. In such cases there may be no visible evidence of infection, and there may be no tenderness of the teeth or gums. A careful X-ray picture of the alveolar processes will often reveal a pus pocket or granulation area. These infected areas are very difficult to eradicate and often the only safe course is to have the tooth extracted. Focal infections in children are much more likely to be in the tonsils than in the teeth.

There is another systemic disease, chorea, which in my experience has been particularly prone to arise from focal infection situated in the tonsils. I have had in my experience during the present year two young girls with chorea who were entirely relieved by removal of their diseased tonsils and adenoids. I now advise the operation in every case of chorea, no matter how innocent the tonsils may look. We are at last coming to pay less attention all the time to how tonsils look, but more attention to the history of the harm they are causing.

*Dr. E. W. Carpenter, Greenville, S. C.*—Decrepitude is a new and better designation than the one we have worn threadbare, viz., neurasthenia. Perhaps neurasthenia was a perfectly good epithet for a condition in which there was loss of tone, but our shortcoming was in our failure to comprehend the pathology of the numerous cases we designated neurasthenia.

Decrepitude is one of the results of civilization; it is the price of intense competition, plus unhygienic environments. The pressure of present time is driving men, women and children into crowded quarters, poorly lighted, poorly ventilated, long hours of intense concentration of mind and fatiguing physical application. The employer and employee are both being driven to their greatest productivity. The above conditions create an environment favorable for man's greatest enemy, namely, saphrophitic bacteria. They are not respectors of person, and because they are evil they love darkness rather than light. I believe that we must make real doctors out of ourselves if we would cope successfully with this modern plague, for there seems to be no part of the body sacred from the abiding presence of this destroyer of man's happiness and efficiency.

Focal infection is the keystone to many of our present-day problems. While the small focus of infection is more difficult to locate than the massive one, I believe it is also often more potent of evil than the large one for the reason that its toxins and bacteria are liberated in small quantities which do not cause the body tissue to rebel at their presence, antitoxins are not generated, and thus the products of these small areas of infection act as continuous and direct poisons. It is this class of infection which gives us most trouble.

Just in this connection I wish to say I believe that many teeth are being needlessly sacrificed. I think it a very serious matter to extract a permanent tooth which shows only a minute area of deviation from the normal at the apex or in the canal unless it be for the relief of pain.

I do not think that the extirpation of tonsils is being overdone, for "all tonsils are bad tonsils" which manifest their presence after twelve years of age. As has been mentioned, the most serious aspect of this subject is the effect upon the muscles of organic life. Given an ulcerating gum, suppurating sinus, septic tonsil, infected adenoid, purulent middle ear or mastoid and it is

not unusual to find a slowly acting stomach, a disrupted cardiac rythm, arthritis, appendicitis, intestinal stasis, thyrotoxicosis, frequent "bilious attacks" or a history of early fatigue.

*Dr. R. C. Lynch, New Orleans, La.*—I really have been asking other members what was "The Modern Plague?" Associated with the idea of the paper, I had expected to hear some special thing in eye diseases, and we had considerable curiosity, much to my pleasure, to be told the topic that the doctor had selected.

In the treatment of focal infections I know of no type of condition that demands more radical measures than they. The whole subject of focal infections rarely centres only around the source. For instance, from the removal of tonsils we secure possibly one of our greatest privileges or pleasures of being laryngologists, after the results we acquire in cases of this kind. The results from the removal of tonsils are often so gratifying that we are inclined to stop there. I had just been thinking, too, that because of our experience with tonsils, possibly sinuses, and maybe the teeth, we are in advance of the general surgeon to this extent, namely, that he does not, to my mind, appreciate the necessity for absolute thoroughness in removing focal infections that we feel in the radical extraction of the focus of infection. Here is one type of lesion in which treatment such as local medication, etc., is of no value. Wherever you have focal infection, or wherever you have a secondary manifestation of a focal infection at any point, that infection must be thoroughly and completely eradicated if you expect the procedure to bring about good results. But neither you nor your patient must expect complete relief immediately upon instituting such measures.

*Dr. M. M. Cullom, Nashville, Tenn.*—I do not know anything that arouses more enthusiasm in me than the outlook given by the doctor for the future of laryngologists. When we thoroughly work out the question of focal infection we are going to be able to relieve an enormous amount of human suffering. I do not know how many of you have heard Dr. Billings tell how he began the study of focal infection; how he was an invalid and went from man to man for several years trying to find out what was his trouble. He said he believed all the time that the infection came from his gall bladder and he finally persuaded a surgeon to remove it. Thereupon he was entirely relieved and now feels as though he "could whip a roomful of wild cats." He said that formerly when a man would come to him under many of the conditions that would bring one to the internist he would look the patient over and say: "My friend, there is nothing I can do for you. I am going to put you on a diet. You must give up your business, live quietly and try to get along the best you can, and accept the idea that you are down and out." He says now when one of these men comes to him he looks in his throat, examines his tonsils, X-rays his sinuses and his teeth, punches his gall bladder and goes all over him 'till he finds the place where the pus is being formed and then goes after it.

I think we shall have to find out and get it through our heads that pus is the cause of a great many troubles from which people are suffering, and we must go to work and find out the location, whether it is in the tonsils, teeth, sinuses or wherever it is, and not be satisfied until we have run it down and have gotten rid of it. As Dr. Lynch says, "Don't have your patients think they are going to be relieved right away." It takes months and sometimes years to eliminate toxins that have been years in accumulating. One of the best business men in Atlanta developed arthritis and was one of the most pathetic cases I ever saw. He had to give up his business and go back to Nashville. He could only shuffle along and had to be lifted in and out of his car. His hands were so swollen and tender he could not shake hands and had the peculiar deformity of true deforming arthritis. I removed his tonsils and cleaned out his ethmoid cells. While he got some relief he did not improve as he thought he ought and he began the round again. He went to Johns Hopkins and had more radical surgery on the ethmoids, with no improvement. He went to Florida and permitted himself to be stung by thousands of bees. He went out to Arizona and took some system of hot baths and sunlight treatment. A few days ago, two years after I operated upon him, he walked into my office as nimbly as any one might. His complexion was as clear and pink as a baby's. He thinks the hot baths cured him. No doubt they did eliminate a great deal of poison from his system, but you and I know that if the source of infection had not been cut off he never could have been relieved.

*Dr. J. G. Murphy, Wilmington, N. C.*—I had a case referred to me about two months ago who had the abscess that prompted me to write the paper upon the advantageous results of tonsil operation which I read before you this morning. He was a minister in our city, and had about all the trend of ills I mentioned in my paper. He landed at Clifton Springs, New York. They kept him there about two months. They did everything to him to relieve his condition and at last concluded that they had not relieved it, so they decided to take out the tonsils. He was 55 years old. They removed his tonsils and he was relieved of his trouble in a week.

Another case that has impressed me very strongly, that I have been able to observe carefully, is my secretary. She was out of my office about two days out of each month and sometimes every two weeks she would be out of the office for about two days with headache. I had refracted her and done everything customary for these headaches. She was about thirty-four years old. I decided to take out her tonsils. Since I removed them last November she has not lost a single day's work from headache.

*Dr. E. H. Cary, Dallas, Tex.*—I think one of the blessings of the sick is the clever internist who has sense enough to know there is something wrong. He may not know where the infection is located, but he knows that there is something wrong. He may start out and eliminate everything in sight, and then if he can not find the cause he should try to use some man that may have studied out part of the anatomy carefully.

It is not unusual in my community to find a case of elevated blood pressure from some focal infection. Relieve that focal infection, wherever

it may be, and watch the patient's blood pressure drop, say, from 215 on down to 165, or 160, depending upon the type of man. This has given to us the clue to cause, plainly as a thing can be, a condition so interesting that internists were looking for the cause and saying, "I am going to diet you and do this and that. I hope we can stop the disease. Very likely you will get better. If you do not, you will die." Now, they look for the place of infection. It does not matter where it is. As Dr. Lynch says, it may be in the sinuses, teeth, tonsils or what not. Fortunately for us, it is frequently in the tonsils, and we therefore are often able to settle this question of high blood pressure.

Just one thing more in which I am very much interested, namely, the question of the third nerve and its involvement. I said to Dr. Price a moment ago: "Don't you consider the third nerve involvement is syphilitic?" Isn't that your impression about the third nerve?

Dr. Price: To some extent.

Dr. Cary: To some extent. I was raised up under the idea that when you had third nerve involvement you had syphilis as a basis. I was raised up in that atmosphere in Bellevue and I heard a great deal about syphilis, and I had to be driven away from the thought that it was the cause of everything. It is the cause of a great many conditions, but it must be kept down to where it belongs.

A girl came in the other day who had paralysis of the superior rectus and of the external rectus; she had diplopia and everything that went with it for the past nine months. She had very probably gone to, and been treated by, very good men, but they had the wrong conception of this very question. They had failed to see the importance of this problem of toxemia from other causes than syphilis. Her tonsils were removed and in three weeks all the muscles functionated, the diplopia was gone, and everything was normal. That is pretty quick.

The other day I saw a man 62 years old with an involvement of the muscles of the third nerve. He only complained while at work of a pain when he failed to cover one of his eyes. He never had had rheumatism. I eliminated syphilis, eliminated his teeth and sinuses and all that, and I watched his old tonsils all the time. I took his tonsils out and located the trouble which he had had for the past sixteen months. In a few days the old man could move one of his eyes inward fairly well, and in a marvelously short time the muscles of the other eye showed improvement, so that he will soon be rid of his diplopia.

*Dr. E. L. Roberts, Nashville, Tenn.*—There is just one point that I want to speak of. So often we see a patient who says, "My tonsils did give trouble, but they do not give trouble now." That i .lly a case to operate upon. In that instance, the tonsil has ceased to fight, has given up the fight, so to speak, but the infection is there just the same, and I think the operation and the subsequent results both bear me out in making these statements. They can not be made too strong. When the patient comes to you and says he has had a great deal of trouble with his tonsils (it does not matter whether it was twenty or thirty years ago), but he does not have any now, take those tonsils out.

*Dr., Davis (closing).*—One thing that has impressed most forcibly upon me the importance of recognizing chronic pyogenic infection has been the finding in comparatively young women and mothers, hopelessly diseased conditions such as organic lesions of heart and kidneys, which possibly admit of improvement but no cure, and which conditions are accounted for by the effects of long-standing foci of infection in the mouth and throat.

A startling fact is that when the militia was recently called out, forty to sixty-five per cent of the National Guard were turned down on account of physical defects, which defects I believe are largely due, directly or indirectly, to focal infection. Of such importance to the physical welfare of man is this matter looked upon that I understand in the German Army attention to mouth hygiene is a routine requirement.

There are two points I wish to stress: first, that of saving man's life by not letting him carry these infections in his body; and secondly, that of making man's life more efficient by the same means.

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## HAY-FEVER AND ITS PREVENTION IN THE SOUTHERN STATES*

By William Scheppegrell, A.M., M.D.,
President, American Hay-Fever Prevention Association; Ex-President, American Academy of Ophthalmology and Oto-Laryngology,
New Orleans, La.

While hay-fever presents a complex of symptoms similar in character, it varies in its season and severity according to the pollinating period of the plants which cause it. As this is dependent upon climatic conditions, we have a resulting variation of the hay-fever season in different portions of the United States.

Although there are many wind-pollinated plants which may cause hay-fever, a careful study of the subject for the past ten years has demonstrated that there are two principal forms of hay-fever, the vernal and the autumnal types. Vernal hay-fever is due almost entirely (90 %) to the pollen of the grasses, and commences in the Southern states about May and ends in July. The autumnal form commences in August and ends in October. It is caused in 85 % of cases by the common and giant rag weeds (Ambrosia ela-

*Read by Title, Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

tior, Fig. 1, and trifida), the latter being practically limited to the proximity of the Gulf, but of great importance in this section.

Other plants which may cause hay-fever in the Southern states are the marsh elder (Iva ciliata), cockle bur (Xanthium echinatum et al.), spiny amaranth (Amaranthus spinosus), yellow dock (Rumex crispus), goose foot (Chenopodium anthelminticum et album). These, however, play a minor role in hay-fever, either on account of their restricted geographical distribution (marsh elder, etc.), or on account of their milder reaction (cockle bur, spiny amaranth, yellow dock, etc.).

An additional proof of the pollen's being the cause of hay-fever was demonstrated at our Biological Laboratory, in which the atmospheric-pollen plates exposed in different parts of New Orleans are examined daily during the hay-fever season. From May until August 15 the atmospheric pollen is practically limited to the grass pollens, and from that date 'till October the rag weed pollen appears almost exclusively (Fig. 2). The beginning, increase and ending of the two forms of hay-fever from a clinical point follows the pollen count as indicated in these plates.

The number of persons who suffer from hay-fever in the Southern states is about 1 % of the population. This is based upon reports of physicians in various states, and corresponds with the results of an investigation by the United States Public Health Service in Louisiana made at the request of this Association. This indicates that approximately 1 % (0.94 %) of the population suffer from hay-fever.

This investigation also developed other useful information which, while referring more especially to Louisiana, will probably also apply to other Southern states.

Regarding the sexes, the males made up 63 % of the cases to 37 % of the females. Contrary to the popular idea that colored persons rarely suffer from hay-fever, it was shown that these were affected one-third as often as the whites.

Regarding occupations, it was found that 38 % of all the hay-fever cases were farmers by occupation. This disposes of another popular fallacy that farmers do not suffer from hay-fever.

The end of the hay-fever season varies considerably in different sections. In western North Carolina, where the cause is the common rag weed (Ambrosia elatior), hay fever develops rapidly on account of the uniformity with which the rag weeds begin to pollinate, which is about August 15. Soon afterward the air is so infected with the pollen that it is found in almost every other blossom which is examined. About the last week in September it rapidly disappears. This year on September 26 the atmospheric pollen plates returned from this section

Fig. 1.

Pollen of common rag weed (Ambrosia elatior), the principal cause of hay-fever in the Southern states. Magnified 500 diameters.

(Hendersonville, N. C.), showed only two pollens on 25 square centimeter of atmospheric pollen plates, or practically negative. In the milder climate of the Gulf Coast, however, the rag weeds are still in active pollination at the end of the western North Carolina season.

The negative pollen count in this case is of importance in considering the distribution of wind-borne pollen. It has been

reported that pollens are found hundreds of miles from the plants which germinate them. While this is occasionally found under exceptional atmospheric disturbances, our records show that the rag weed pollen disappears from Hendersonville, N. C., about September 15 in spite of the fact that fifteen miles from this point the common rag weed (Ambrosia elatior) continues to pollinate for several weeks. While the real limit is probably much less than this, our records for eight years show that the rag weed pollen does not, except under extraordinary conditions, traverse this distance.

The severity of the symptoms during the hay-fever season depends upon the velocity and duration of the wind. If this is mild (one to five miles per hour) and the weeds for a distance of a quarter of a mile have been cut, it is not ordinarily sufficient to cause hay-fever, even if blowing from the direction of the hay-fever weeds. An increase to twelve or more miles per hour will create atmospheric disturbances which will infect the atmosphere with hay-fever pollens for several miles and to a considerable height, so that even after the subsidence of the wind the pollen will float in the atmosphere for several days. This applies especially to the common rag weed which measures only 15 microns in diameter and whose spiculated surface increases its traversing capacity. Its rate of falling is only 5 feet per minute, so that if it is caught by a vertical wind and carried to a high attitude it will take several days to descend even with light winds. This has also been demonstrated by our atmospheric-pollen plates.

Grass pollens, on the other hand, are larger, their diameter being from 25 to 55 microns, which greatly reduces their potential area. As a rule, also, the symptoms from the grass pollens are less marked than from the rag weed pollens.

The treatment of hay-fever is still in an unsettled condition, although several methods appear promising. In most cases the hay-fever subject has an extremely sensitive nasal membrane, and any treatment which will reduce this irritability will be of benefit.

The removal of the exciting cause, the weeds which produce the pollens, is the important factor in the prevention of hay-fever. In the case of the vernal type, due to the grasses in which the potential area is not great, this presents no great difficulties. The cutting of the weeds for a half a mile will usually give entire relief. In New Orleans, our efforts have resulted in a remarkable reduction of these cases.

In the case of the fall type, however, the potential area of the rag weed is so great that such measures will not prevent an attack during the prevalence of high winds, which carry the pollen for great distances. It will, of course, greatly shorten the period, and such measures should therefore be strongly advised.

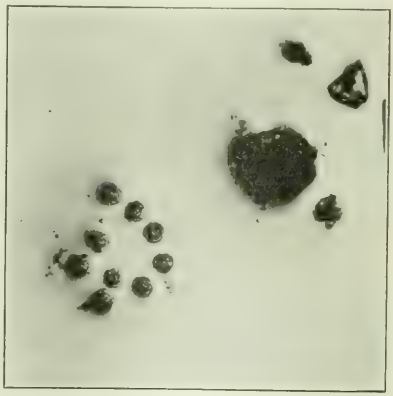

Fig. 2.

Atmospheric-pollen plate, showing prevalence of the rag weed pollen during the fall hay-fever season. Cut shows 9 pollens in centre. Magnified 250 diameters.

The complete relief, however, depends upon the removal of the pollen-bearing weeds not only from cities, but also from the surrounding country. As the farmer becomes educated in the relationship of rag weeds to hay-fever, he will take more active steps to eradicate this weed or at least to prevent it from reaching the pollinating stage. Eventually legislation will complete the work of education which will result in the removal of the rag weed as an injury alike to farming and to health.

## AUTHORS' ABSTRACTS

### *Eye, Ear, Nose and Throat*

*Exostoses of the Orbit.* Frank LeMoyne Hupp, Wheeling, W. Va. Surgery, Gynecology and Obstetrics, Vol. xxiv, No. 2, February, 1917, p. 221.

After reviewing the literature, Hupp reports the history of a young man who developed an exostosis of the orbit. The tumor was fifteen years in reaching the size of an English walnut. The hard, bony mass gradually crowded the eye to the outer orbit, and by encroachment pressure became not only unsightly and dangerous but impaired the integrity of the eye with blurring vision, diplopia and pain.

The mass was attached to the ethmoid bone and its removal was attended with profuse bleeding into the nose, pharynx and mouth. In less than ten days after the operation, the eye had resumed its natural position in the orbit, with normal vision and very little evidence of scar.

The cause of these growths may be looked for in an abnormal embryonic condition of the bone cells. They may be congenital or develop as a result of trauma.

*Operative Comment.* — The hemispheroidal shape and sessile attachment often make the removal of exostoses difficult. Determine early the point of attachment of the tumor; for to chisel ruthlessly or drill through the densely resisting pedicle, with the brain in dangerous proximity, with infections always present, would make the operation an extra hazardous performance.

Berlin collected 32 cases. Eight, or 25 %, died. In the 16 cases of this series in which the growth was situated in the roof of the orbit, six died, giving a mortality of 38 %. The cause of death in these cases was a meningitis, encephalitis, and abscess. The greatest conservatism should be observed when the growth occupies the orbital plate of the frontal bone.

If the eye has been pushed out of the orbit by a large osteoma and has caused blindness, it is better to relieve the patient by enucleating the eye rather than expose him to the dangers of the extirpation of the growth.

The eye ball must be carefully guarded when leverage is attempted in the extirpation, and precautions must also be directed toward preserving the surrounding muscles, tendons, infraorbital nerve and lachrymal gland.

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## AUTHORS' ABSTRACTS

### *Surgery, Gynecology, Obstetrics and Genito-Urinary Disease.*

(Continued from page 341)

*The Operative Treatment of Tuberculosis of the Spine.* Nathaniel Allison and Herbert H. Hagan, St. Louis, Mo. The Journal of the American Medical Association, Vol. LXVIII, No. 6, February 10, 1917, p. 452.

Of the forty patients operated upon, nine had reached adult life before the onset of the disease, and thirty-one were children. The oldest patient was 37 years of age and the youngest 19 months. The diagnosis of tuberculosis of the spine was made positive in each case by Roentgenographic study, the exact location and extent of the disease being clearly made out, and by clinical tests for tuberculosis, and wherever possible, by guinea-pig inoculation.

The first operation was done October 5, 1912. Six patients were operated upon in 1913; eleven in 1914; fourteen in 1915; and nine patients of this group in 1916. Of these forty, ten were operated upon by the method of Hibbs and thirty by the method of Albee.

Group 1: Patients operated upon in the early stages of Pott's disease with little or no evidence of deformity and no complications. Without exception this group of 15 patients has stood the operation well, has had rapid convalescence, all symptoms have disappeared, and it is felt that they represent complete recovery.

Group 2: Patients operated upon that presented well-marked deformity with persistence of more or less acute symptoms, but no complications. Of these nine, eight have made recovery, are about without supports and are in fairly robust health. One patient has shown a return of acute symptoms after three years, and has signs of a developing pressure paralysis. This patient was operated upon after the method of Hibbs and did very well up till three months ago. She is now being treated as one would treat conservatively a case of Pott's disease with paraplegia.

Group 3: Patients who were operated upon in the presence of complication to their more or less acute processes of tuberculosis of the spine. These complications were: Psoas or lumbar abscess, 5 cases; tuberculosis of other joints, 2 cases; pressure paralysis, 5 cases; pregnancy, 1 case; and pulmonary tuberculosis, 4 cases.

Two deaths were due to tuberculous meningitis. Three were infectious at the time of operation without serious consequences. Fifteen patients completely recovered without deformity or complication, and at the present time are far enough along since their operation to be called absolutely well. Eight have deformity, but with the disease arrested and no active symptoms. Of the sixteen patients who had complications, three with paraplegia have completely recovered, and two have died. Of those with pulmonary tuberculosis (four patients) there is evidence of activity of the disease at present, but the disease of the spine is not causing symptoms. Of th patients with tuberculosis of other joints (two), these are still under treatment, but are making slower recoveries. Of those with psoas abscess (five) all five have recovered and the abscesses have ceased to discharge.

The total of this group would be four cases of pulmonary tuberculosis, and two of tuberculosis of other joints, making six still under observation, leaving ten in which the disease has been arrested.

Experience with forty cases leads the authors to believe that an operation for ankylosing the spine should be performed in every case of Pott's disease as early as a diagnosis can be accurately made, and that the presence of complications should not influence the surgeon in delaying the operative procedure, unless the complications are of too grave a nature. They do not feel in a position to discuss the relative merits of the Albee and the Hibbs operations. They have had equally good results with each procedure. They feel, however, that the good results obtained are much more conclusive in the case of adults, who respond very slowly to conservative measures.

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# EDITORIAL DEPARTMENT

## THE NEED FOR MEDICAL OFFICERS IN THE ARMY AND NAVY

American ships, flying American flags, have been sunk by German submarines. American citizens have been killed in the ruthless and inexcusable warfare on American commerce by a nation that disregards treaties and defies international laws. There is no escaping the conclusion that Germany is waging war against the United States; and it only remains for President Wilson and Congress to declare that we are in a state of war with the Prussian monarchy.

Then must follow preparations for national defense that will let the world understand that the United States will protect her citizens and her rights. It is probable that a million or more men will be called into service at once; and that, if needed, all the resources of the Nation will be mobilized to aid the Allies in ending the horrible war that is making a charnel house of Europe, before our [illegible] are invaded. It is also certain that [illegible] this time the United States must maintain a large Army and Navy as a matter of self-protection, and if she would play her part in a league of nations to maintain peace.

In the call to arms that seems sure to come the medical profession will be expected to give its full quota for national defense. The region of the country known as the South, that gave heroes and geniuses like Hunter McGuire, Samuel Preston Moore, Josiah Nott and other great surgeons to the Confederacy; and that gave Walter Reed, William Crawford Gorgas, Henry Rose Carter, Robert E. Noble and others of like attainments to the United States in the war with Spain, will send its best and noblest physicians and surgeons to the medical service of the Army and Navy in this hour of greatest need for well trained and efficient medical men.

Major Robert E. Noble in a forceful address before the Southern Medical Association on "The Relation of the Medical Profession to Medical Preparedness",[1] discussed the opportunity for medical men in the service of the United States Army, and he called attention to the need for physicians, surgeons and men in all the specialties of medicine, to enlist in the Medical Section of the Officers' Reserve Corps. At that time, last November, Major Noble said that of the 25,000 physicians needed for the Officers' Reserve Corps only 2,026 had enlisted. The South, which has about one-third the population of the United States, should provide at least 8,000 physicians and surgeons for the Army if a million soldiers are called into service.

At the Atlanta meeting of the Southern Medical Association President Wilson's physician, Captain Cary T. Grayson, who has since been promoted to the rank of Rear Admiral, in an address on "Medical Preparedness,"[2] very graphically described the wonderful development of the Medical Service of the Navy, and called

[1] Southern Medical Journal, February, 1917, pp. 91-95.

[2] Ibid, January, 1917, pp. 6-12.

attention to its need for well trained medical men.

Editorial comments on the importance of these addresses were made in the January and February numbers of THE JOURNAL, in which we urged that Southern physicians should enlist in the Reserve Corps of the Army and Navy, that they might prepare to serve their country should war ever come. The articles by Major Noble and Rear Admiral Grayson should be reread by physicians who contemplate entering the medical service of the Army and Navy.

War has come, and a better opportunity for physicians to serve their country has never been offered. Those who have the splendid heritage of the heroism from their fathers who wore the gray, and the sons of the brave soldiers who fought for the Union, will together respond to the call of their Nation. Under the leadership of the greatest sanitary genius in the history of the world, Major General Gorgas, or under the Navy's great surgeon, Rear Admiral Braisted, the physicians of the South will do their part in protecting our soldiers from disease, and in caring for the wounded in the war that has been forced upon us by a nation that is fighting in blind rage, like a hunted animal trapped in its lair.

## FOOD PREPAREDNESS

The Department of Agriculture has sent patriotic Americans in all regions of the United States urging the people to plant gardens, cereals, potatoes and other food crops in order that each community may be independent agriculturally, in the event that this country should have a prolonged war with Germany.

The city dwellers are urged to plant their back yards, vacant lots and every available foot of soil in potatoes, peas, beans, spinach and other vegetables. The farmers are urged to increase acreage in soy beans, peas and other legumes in order that there may be no reduction in their protein foods; and each farmer is urged to plant a large garden, raise at least one hundred chickens a year, and have his own cows and hogs.

The importance of this advice is apparent when one remembers that if there should be large movements of troops or munitions the railroads would not have sufficient rolling stock for that purpose and at the same time handle the commerce of the country, including the transportation of food for the civil population. The present shortage of the food supply even when we are at peace also emphasizes the need for larger food crops.

Whether there be war or peace it would add to the health and prosperity of the country if the city dwellers would cultivate vegetables in their back yards and vacant lots, and if the farmers would diversify their crops, thus living at home and raising a surplus to sell in the markets. This is particularly true in the cotton states, where the single crop system has proved disastrous to the farmers.

The food problem is of more than economic importance. It becomes a public health question when there is a possibility of the food supply becoming insufficient to meet the nutritional needs of a people. The poorly nourished individual is most susceptible to pellagra, tuberculosis and other diseases in which nutrition is of paramount importance. He is also an easy victim to all the endemic and epidemic infections. The general death rate increases in any country when a considerable proportion of its population is undernourished. The infant mortality is most affected. It is said that in Poland there are no children under four years of age.

Of course we can not conceive of the people of our great country suffering for nourishment as have those of Europe; but there is real danger of a reduced food

supply whether we have war or peace. Physicians who know that such a condition would affect the health and lives of their people should impress their patrons and friends with the necessity for planting more food crops. Indeed, physicians who are in close touch with the family life of their patrons should lead in this and all other efforts to improve health conditions and to increase prosperity among their people.

## FOOD SUPPLY AND GERMAN EFFICIENCY

Having spent some time in hospital work in Berlin and Vienna, studying particularly dietetics and other subjects pertaining to digestive diseases, and having made a number of visits to the rural districts of Germany and Austria, where the writer had the opportunity of observing living conditions among the Germans and Austrians, he was impressed by the fact that the middle and upper classes, and the laborers and peasants to a less extent, in those countries overate enormously, which, with their habits of excessive beer and coffee drinking, caused a prodigious amount of stomach, liver, heart and kidney diseases among them. The well-known predilection of the Germans to overeating, particularly of meats and other proteins, probably partly accounts for their inordinately high death rate over fifty.

The writer estimates that the average adult German, before the present war, consumed per day from 4,500 to 6,500 calories of food, at least one-third of which was protein (beef, pork, fowl, fish, cheese, etc.). From 3,000 to 4,000 food calories, of which not more than from one-tenth to one-eighth should be protein, is a liberal daily amount for the person of average weight. It would, therefore, seem that the food supply in Germany would have to be reduced more than one-half before German efficiency would be decreased from lack of nourishment.

From various reports published in the magazines and newspapers regarding the food situation in Germany, and with some knowledge of habits and lives of the people in that country prior to the present war, the writer thinks it probable that up to about one year ago, while the average German had lost weight,—he could easily spare some flesh,—his efficiency had increased as the food, coffee and beer supply decreased.

Recent reports, however, indicate that the food situation in Germany has become very serious. It is said that meats and fats have almost disappeared from the diet of the German people; and that tuberculosis—a disease that rarely occurs in well-nourished people and was therefore less prevalent in Germany than in most other countries prior to the war—has increased more than 500 % in Berlin.

Had the Germans not had the habit of overeating and had they conserved their food supply the first year or two of the war, they would not now be in such distress that they would resort to submarining merchant ships in order to try to make England suffer for food as Germany is now suffering.

Napoleon is credited with the saying that "an army moves on its stomach." He probably learned that from the inglorious retreat from Moscow of his starving soldiers. If reports of the food supply in Germany and Austria are true, empty stomachs will soon prove ineffective vehicles for transporting their armies, and we may expect soon to see the Kaiser's wonderful military machine go to pieces—provided, of course, that the food supply of the Allies can be kept up to their physical needs.

Americans are not given to gormandizing so much as the Germans were prior to the war, but our efficiency would be in-

creased if we ate less and exercised more. It would seem, as a part of our preparedness plans both for war and peace, that now is the time to carry on the propaganda for rational eating and other proper habits of living to make every man and woman fit to perform best his or her part in our national life; and that if war should come our food supply would be equal to the nutritional needs of great armies and navies, as well as for those who remain in civil life.

## THE ERADICATION OF MALARIA

Dr. Frederick L. Hoffman, of the Prudential Life Insurance Co., is perhaps the world's greatest authority on vital and mortuary statistics. He has the faculty which is rare among statisticians of vitalizing, or making practical application of, the facts and deductions drawn from studying statistics.

Dr. Hoffman has shown a remarkable interest in, and a thorough understanding of, sociological conditions in the South. Twenty-five years ago he completed the most comprehensive statistical study of the Negro problem that had ever been undertaken, before or since that time; and students of the race question regard his book, "Race Traits and Tendencies of the American Negro," as the most valuable contribution to the literature on that subject. His conclusions that the Negroes of the United States are deteriorating physically and that in time they will become a negligible factor in American life, have never been controverted; and the 1910 Census, which showed a decrease of the rate of increase of the Negro population in the United States, seems to verify his predictions.

Dr. Hoffman has, during the past few years, become interested in the study of malaria, particularly from the historical and statistical viewpoint, and his conclusion that malaria can and should be eradicated from the United States, is shared by those who have dreamed of the time when this easily preventable disease will cease to be a Southern problem. Having reached this conclusion, Dr. Hoffman, without remuneration or hope of reward other than the pleasure that comes from helping one's country to become a better place in which to live, has devoted a great deal of time in an effort to evolve a practical, working plan whereby at least a start can be made toward permanently rendering the United States free from malaria.

At the suggestion of Dr. Hoffman there was organized in Washington last May, during the sessions of the American Congress of Physicians, a National Committee on Malaria, which will work with, and aid in correlating, all the public health agencies now in existence for a campaign against malaria. This Committee is composed largely of members of the Southern Medical Association, including representatives of the United States Army, Navy, and Public Health Service who are interested in various phases of malaria work.

Dr. Hoffman also suggested that Congress be called upon to appropriate $250,000.00 for anti-malaria work under the direction of the Surgeon-Generals of the Army, Navy, and Public Health Service, and the Secretary of Agriculture.

In the Department of Tropical Diseases and Public Health in this number of THE JOURNAL is published a resume of an address entitled "A Plea and a Plan for the Eradication of Malaria," delivered by Dr. Hoffman before a joint session of the Sections on Medicine and Public Health at the Atlanta meeting of the Southern Medical Association. Following this address a resolution was unanimously adopted approving a Federal appropriation for anti-malaria work.

The eradication of malaria is a local, state and national problem, though the re-

gion known as the South is most interested in the consummation of that great work. Southern physicians, since they are best informed regarding the ravages of malaria, and since their patrons and friends are most affected by it, should take up with their National representatives the need of a Federal appropriation for its eradication.

Our statesmen should be shown that such legislation ought to be a part of our National preparedness program, because, if war comes, there are thousands, who are incapacitated for military service because of malaria, all of whom by the expenditure of a small amount of money may be made into efficient soldiers and good citizens. We should convince our senators and congressmen that public health legislation, particularly the appropriation of money for the United States Public Health Service, should go hand in hand with military and naval preparedness, that patriotism demands the employment of measures to conserve the health and lives of our people as well as to protect them from the invasion of foreign foes.

## APRIL AND MAY MEETINGS OF STATE MEDICAL ASSOCIATIONS

April and May seem to be the best months for the meetings of state medical associations, since thirteen out of sixteen meetings in the South occur in those months. The programs for the various meetings that have been received by THE JOURNAL show that many important papers will be read before each of them.

[illegible] advantages of attending the gather[illegible] state medical associations do not [illegible] e discussed. Aside from its being to his personal interest, the physician should consider it a duty to meet and mingle with his fellow practitioners in his state once a year. The wise and progressive physician will make every effort to attend.

The following is a list of the dates with the places of meeting of state medical associations that hold their sessions in April and May:

*Tennessee*—Nashville, April 3-4-5.
President, C. N. Cowden, Nashville; Secretary, Olin West, Nashville.

*Alabama*—Montgomery, April 17-18-19-20.
President, Henry Green, Dothan; Secretary, H. G. Perry, Montgomery.

*Georgia*—Augusta, April 18-19-20.
President, J. G. Dean, Dawson; Secretary, W. C. Lyle, Augusta.

*Louisiana*—Alexandria, April 17-18-19
President, W. H. Seemann, New Orleans; Secretary, L. R. DeBuys, New Orleans.

*North Carolina*—Asheville, April 17-18-19
President, Chas. O'H. Laughinghouse, Greenville; Secretary, B. K. Hays, Oxford.

*South Carolina*—Spartanburg, April 17-18-19.
President, C. B. Earle, Greenville; Secretary, E. A. Hines, Seneca.

*Maryland*—Baltimore, April 24-25-26.
President, J. W. Williams, Baltimore; Secretary, J. I. France, Baltimore.

*Arkansas*—Little Rock, May 1-2-3.
President, M. L. Norwood, Locksburg; Secretary, C. P. Meriwether, Little Rock.

*Mississippi*—Jackson, May 8-9-10.
President, T. M. Dye, Clarksdale; Secretary, E. F. Howard, Vicksburg.

*Texas*—Dallas, May 8-9-10.
President, J. M. Inge, Denton; Secretary, Holman Taylor, Fort Worth.

*Oklahoma*—Lawton, May 8-9-10.
President, Chas. R. Hume, Anadarko; Secretary, C. A. Thompson, Muskogee.

*Missouri*—Springfield, May 14-15-16.
President, J. Franklin Welch, Salisbury; Secretary, E. J. Goodwin, St. Louis.

*Florida*—Atlantic Beach, May 18-19.
President, E. W. Warren, Palatka; Secretary, Graham E. Henson, Jacksonville.

## NEW JOURNALS

THE JOURNAL takes this opportunity of cordially welcoming these new additions to medical journalism.

### THE JOURNAL OF UROLOGY

Dr. Hugh Hampton Young, of Balti-

more, has founded the *Journal of Urology* with a view toward furnishing a clearing house, so to speak, for all that pertains to urology, be it experimental, medical, surgical, chemical, physical, pathological, bacteriological, or what not. Formerly one would have to search through many varied and often obscure publications to find all that related to this branch of medicine. The idea of the editor is a good one. We have never seen a "first issue" which impressed us so favorably as does this. Indeed it is a remarkably valuable contribution to the literature, having every earmark of an old and well-established publication. At the outset it easily takes rank with any medical journal published.

THE AMERICAN JOURNAL OF SYPHILIS

The first of the year marked the appearance of *The American Journal of Syphilis*, published quarterly by C. V. Mosby Co., of St. Louis. The need of such a journal is apparent. So varied are the manifestations of this scourge that syphilis is encountered by practitioners and specialists in every branch of medicine. Hence the universal interest which this publication arouses. When it is remembered that Dr. Loyd Thompson is the Managing Editor, and Dr. W. H. Deaderick, the Associate Editor, both of Hot Springs, Ark., the high standard and the success of this journal are assured. The first issue contains articles on syphilis prepared by a number of distinguished physicians. From a publisher's viewpoint it is one of the most attractive magazines now published.

ENDOCRINOLOGY

Realizing that such periodicals as *Heart, Zentralblatt fur Herzkrankheiten, Brain*, etc., have been wonderful factors in stimulating interest and work in those several lines, we were pleased to note the appearance of the first number of *Endocrinology*, in January, 1917. It is a quarterly, the bulletin of the Association for the Study of the Internal Secretions, a society whose membership includes many of the country's foremost internists. Its Editor is Dr. Henry R. Harrower, of Glendale, California. The initial issue is of a very high order of excellence, not only containing seven original papers, but also one hundred and ninety-three abstracts of articles published elsewhere throughout the world. In view of the importance of the subject of internal secretions and the splendid showing made in the first issue, we are deeply impressed by the possibilities of *Endocrinology*.

MEDICINE AND SURGERY

While it can not be said that there was any particular crying need of such a magazine, there is always a place for a well-conducted journal in any line. That this latter requirement is being met in this case we need only add that Dr. Philip Skrainka, former Literary Editor of *The Interstate Medical Journal*, is its Editor and owner. The plan of this monthly is to issue numbers from time to time devoted to special subjects. For instance, the first, that of March, 1917, is given over to Surgery, and offers an exceedingly valuable collection of articles, for the most part by many of America's well-known surgeons. It is printed on good paper; the illustrations are numerous and excellent, and the general make-up is such as to command our warmest praise.

SOUTHWESTERN MEDICINE

This is the result of an amalgamation of *The New Mexico Medical Journal, The Arizona Medical Journal* and *The Bulletin of the El Paso County* (Texas) *Medical* Society, and is the official organ of the Medical and Surgical Association of the Southwest.

The first number appeared in January of this year as a monthly. It is a very creditable publication from a literary and

scientific standpoint. Such a journal is especially worthy of the hearty support of every physician within its territory and of the high esteem and praise of the profession in general when it is remembered that its advertising section is of the cleanest and most ethical nature and that no proprietary preparations will be considered unless they have been accepted by the Council of Pharmacy of the A. M. A. A policy of this character means a financial loss of thousands of dollars a year, but it likewise shows the courage and high ideals of its editorial and business staff.

THE MISSISSIPPI VALLEY MEDICAL JOURNAL

In January of this year *The Louisville Monthly Journal of Medicine and Surgery* changed its name to *The Mississippi Valley Medical Journal.* At the same time it became the official organ of that estimable organization, the Mississippi Valley Medical Association. The change will unquestionably prove beneficial both to *The Journal* and to the Association. Dr. Henry Enos Tuley, whose name is well known as a pediatrician and author, will continue as Editor. It will be published monthly at Louisville.

# SOUTHERN MEDICAL NEWS

*ALABAMA*

At Birmingham, according to a recent statement of Dr. F. E. Harrington, County Health Officer, the treatment of rabies will soon be given in Birmingham.

At Birmingham, recently, the Jefferson County Medical Society met in joint session with the Alabama Sociological Congress in a discussion of the tuberculosis problem.

At Birmingham, the Women's Civic Board is to co-operate with the City and County authorities in making April a "clean-up" month.

At Montgomery, on April 17, will be held the annual meeting of the State Medical Association.

At Birmingham, especial emphasis is being placed upon the enforcement of all the health regulations and an anti-spitting campaign is being planned.

At Montgomery, it has been decided by the Supreme Court that a coroner in the State of Alabama must be a practicing physician in good standing.

At Montgomery, according to the January report of the State Board of Health, five children died with measles, seven with scarlet fever, thirteen with whooping cough, and seventeen with diphtheria.

*Deaths*

Dr. Charles M. Watson, a prominent physician of Florence, died at his home in that City on March 16th.

*ARKANSAS*

At Fort Smith, on March 20, the Tenth District Medical Society met.

Dr. O. P. Robinson, Little Rock, suffered a stroke of paralysis recently and is reported to be in a serious condition.

*Deaths*

Dr. Humphrey M. Burfield, aged 73, died at his home in Bentonville on February 8.

Dr. Edwin Bentley, aged 92, died at his home in Little Rock on February 5.

Dr. W. B. Welch, aged 89, died at his home in Fayetteville on March 10.

*NORTH CAROLINA*

Dr. Julius M. Hill, Murphy, was married to Miss Kathryn Bayliss, of the same City, on January 4.

*Deaths*

Dr. J. C. Black, aged 59, died at his home in Pioneer Mills on February 4.

*FLORIDA*

Included in the recent recommendations made by the Board of Health to the Governor is one advising the placing of veterinary medicine under the Department of Agriculture and also the removal of the burden of the care of the crippled and indigent children.

The members of the Eclectic Board of Medical Examiners of Florida have been impeached and dismissed from office by the Governor of the State. The reason given for the action of Governor Catts is the alleged issuing of bogus diplomas and licenses.

*Deaths*

Dr. William R. Stevens, aged 47, Deland, died in Jacksonville at a local infirmary on March 6.

*GEORGIA*

At Macon, Ben S. Perkins, Chairman of the Health Committee of the City Council, acting upon the recommendations of the State Board of Health, is investigating the installation of a new health system to be operated under the provisions of the Ellis law.

At Atlanta, according to a recent decision of

(Continued on page 28)

# When You Want

to use a hypodermice tablet you want a SOLUBLE one—not a semi- or slowly soluble one that may—and probably will, block up the only asceptic needle you have with you, and you mayhap blocks—or miles—from your office and the drug store is closed up for the night.

## You Never Run That Risk

with REALLY SOLUBLE hypodermics—ours for instance. And ours cost no more per tablet than "the other kind," in fact, cost less when you figure in your own chagrin, the bystanders' and patient's caustic comments, and the price of the "blocked" needle.

Most druggists can and do supply the SOLUBLE hypodermics of

# SHARP & DOHME

THE HYPODERMIC TABLET PEOPLE
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$1.50

A valuable adjunct in the treatment of syphilis. Syringe contains approximately ten doses. Credit of 50 cents on return of syringe. This Mercurial Oil has been accepted by the Council on Pharmacy and Chemistry. Send for pamphlet.

**WASSERMANN TEST**, Blood or Spinal Fluid
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(Continued from page 366)

calling or profession will be allowed on the Board of Trustees of the Grady Hospital.

At Moultrie, there was held the regular meeting of the Second District Medical Society on February 21.

At Newnan, during the eighteenth semi-annual meeting of the Fourth Congressional District Medical Society, held on February 20, officers for the ensuing year were elected as follows: President, Dr. Frank P. Norman, Greenville; Vice President, Dr. Paul Paniston, Newnan; Secretary-Treasurer, Dr. Hubert Rawizer, Sharpsburg. The August meeting will be held at Warm Springs.

At Augusta, the citizens have been warned, through a communication to the Mayor and Council, that the filter plant is greatly overtaxed, due to wasted water. For this reason steps are being taken toward the installation of meters.

At Atlanta, recently, steps have been taken looking toward the removal of the "pesthouse" and stockade to another part of the City, where it will not interfere with the improvement of the section where it is at present located.

Dr. J. G. Earnest was the honor guest recently at a banquet given by the Atlanta physicians on the occasion of his fiftieth anniversary in the practice of medicine.

Dr. David Moury, aged 80, died at his home in Atlanta on March 10.

Dr. T. B. Phinizy, aged 92, died at his home in Augusta on February 16.

## *KENTUCKY*

At Maysville, efforts are being made to raise $3,300 to meet the Federal appropriation of $9,900 to carry on health work in the county.

At Louisville, recently, the courts upheld the right of the State Board of Health to prevent any but licensed physicians from administering anesthetics.

Surgeon John McMullen, U. S. P. H. S., is under orders to proceed when necessary to localities in the states of Kentucky, Tennessee, Virginia and West Virginia for the purpose of supervising the operations of trachoma hospitals and engaging in other duties involving the control of this disease.

Dr. E. R. Cole, Winchester, was married recently to Miss Anna Crandall, of Ashway, R. I.

*Deaths*

Dr. W. T. Lively died at his home in Buffalo, LaRue County, on January 18.

Dr. John Prather, aged 68, died at his home at Woodland Mills recently.

Dr. H. F. Williamson, aged 55, died at his [illegible] Paducah on February 9.

Dr. William H. Sanders, aged 73, died from [illegible]pelas at his home in Paducah on Jan[illegible].

Dr. S. E. Hampton, aged 79, died at his home in Milton on March 13.

Dr. Braxton D. Cox, aged 72, died at his home in Campton on February 7.

Dr. T. H. Stucky, aged 57, died at his home in Louisvill[illegible] [illegible]uary 18.

## *LOUISIANA*

After January 1, 1918, according to a recent ruling of the State Board of Medical Examiners, a two years' college course will be required of those beginning the study of medicine.

*Deaths*

Dr. Thomas J. Vance, aged 82, died at his home in Minden on February 3.

Dr. James E. Blancha, aged 76, died at his home in New Orleans on January 29.

## *MARYLAND*

At Bayview, the City Detention Hospital for the Insane will soon be overfilled, due to the fact that the last Legislature failed to provide funds for the erection of new buildings.

At Baltimore, during a campaign to raise funds for the Maryland General Hospital, the sum of about $165,000 was given. The amount asked for was only $150,000.

At Ellicott City, a recent outbreak of typhoid fever, in which twelve cases were reported, is said to have been traced to the water supply.

Dr. George E. Barnett, Johns Hopkins University, was recently named Chairman of the Red Cross Emergency Relief Committee of the Federated Charities.

*Deaths*

Dr. Ernest H. Rowe, aged 34, died at his home in Baltimore on March 14.

Dr. John T. McCarthy died at his home in Baltimore on March 7.

Dr. John T. Parker, aged 77, died at his home in Stockton on February 7.

## *MISSISSIPPI*

At Laurel, recently, a movement was put on foot to pass ordinances requiring the adoption of the sanitary toilet in that City.

At Jackson, the State Medical Association will be held in May.

*Deaths*

Dr. William H. Barnard, aged 67, died at his home in Anguilla on February 13.

Dr. W. N. Davis, aged 54, died at his home in Meehan Junction on February 14.

Dr. S. S. Smith, aged 55, died at his home in Ellisville on February 27.

## *MISSOURI*

At Joplin, the health authorities have not been successful in stamping out the threatened epidemic of smallpox and new cases are being reported daily.

At St Louis, the Tuberculosis Society is taking the lead in the organization of a Public Health Association. The object of this body will be the education of the laity along the lines of disease prevention.

At St. Louis, there has been a widespread epidemic of measles, as many as 387 cases having been reported in one week.

At Kansas City, the railway company is cooperating with the health authorities in an earnest anti-spitting campaign.

At St. Joseph, the local health authorities have been ordered by the State Board of Health to

(Continued on page 30)

## Obstinate Constipation of Infants and Young Children

is usually a dietetic affair, but is sometimes due to lack of muscular tone.

While **INTEROL** is neither a food nor a tonic, it is undoubtedly of service in these conditions because it supplies lubrication in the large bowel, facilitating both peristalsis and evacuation. Thus there is less likelihood of intestinal stasis with its resulting fermentation, putrefaction and autotoxemia.

**INTEROL** moves the child's bowels without the enervation, irritation, griping, or after-constipation of castor oil—and is "easy to take."

**INTEROL** is a *particular kind* of "mineral oil," and is not "taken from the same barrels as the rest of them": (1) there is no discoloration on the $H_2SO_4$ test—absolute freedom from "lighter" hydrocarbons—so that there can be no renal disturbance; (2) no dark discoloration on the lead-oxide-sodium-hydroxide test—absolute freedom from sulphur compounds—so that there can be no gastro-intestinal disturbance from this source; (3) no action on litmus—absolute neutrality; (4) no odor, even when heated; (5) no taste, even when warm. Almost any child can "take" **INTEROL.**

Pint bottles, druggists. **INTEROL** booklet on request; also literature on "Obstinate Constipation of Infants and Young Children."

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that we feel we owe it to our patrons to direct their attention to the usefulness of this product as a local application, *as well as* for surgical lubrication.

No claim is made that K-Y Lubricating Jelly will act with equal efficiency in every case; but you will secure such excellent results in the majority of instances that we believe you will continue its use as a matter of course.

NO GREASE TO SOIL THE CLOTHING!

*Collapsible tubes, 25c. Samples on request*

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## *"Sick Headache"*

*—and other headaches—*

are usually relieved more or less promptly as you remove their cause. In the meantime—

### *K-Y ANALGESIC*

locally "rubbed in," will usually afford comfort without blistering or soiling.

*Gives Nature's Corrective Forces a Chance*

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(Continued from page 28)

prosecute physicians endeavoring to "cover up" cases of infectious disease.

Dr. Daniel G. Stine, Columbia, and Miss Ellen Wilder, Jacksonville, Ill., were married on December 23.

*Deaths*

Dr. Oscar Potter, aged 90, died at his home in St. Louis on February 28.

Dr. Alva Taylor, aged 42, was killed in an automobile accident at Plattsburg on February 19.

Dr. Thomas D. Miller, aged 54, Kansas City, died at a local hospital on February 26.

Dr. W. F. Burton died suddenly at his home in Kansas City on March 1.

Dr. C. A. Winn died at his home in Cuba on February 21.

Dr. Florence L. Evans, aged 33, Bacteriologist of the East St. Louis Department of Health, died in Corpus Christi, Tex., recently.

## *OKLAHOMA*

Dr. S. Z. Hawley, Tulsa, was recently investigating the subject of erecting a new incinerating plant for the City.

At Oklahoma City, Dr. W. S. Clark has been given a sixty day jail sentence for violating the Federal anti-narcotic law.

At Drumright, recently, Dr. M. Karasek was injured in an automobile accident.

*Deaths*

Dr. Duncan B. McFarlane died at his home in Tulsa on February 8.

Dr. D. D. Weiser, Apache, aged 49, died recently in Rochester, Minn.

## *SOUTH CAROLINA*

At Orangeburg, on March 10, was held a large mass meeting in the interest of public health.

The Tri-State Medical Association of Virginia, North Carolina and South Carolina met at Durham, S. C., on February 20.

At Columbia, recently, the sanitary work on the new filtration plant of the City was being directed by Surgeon H. R. Carter, U. S. P. H. S.

*Deaths*

Dr. J. E. W. Haile, aged 57, died at his home in Rockhill on February 11.

Dr. John Lunney, aged 78, died at his home in Darlington on February 7.

## *TENNESSEE*

At Nashville, there is an ordinance under consideration requiring the Pasteurization of all milk used in the manufacture of ice cream.

At Chattanooga, the authorities are taking steps to clear up the unsanitary conditions left by the recent flood in that district.

In order to remove the administration of the County Health Department from politics, a bill has been introduced in the lower house providing for the election of the county authorities by a commission of five members selected by the County Court.

At Nashville, the State Medical Association will hold its annual meeting on April 3, 4 and 5.

At Memphis, a lecture course on public health has been instituted by the University of Tennessee School of Medicine.

At Chattanooga, the sum of $3,500 has been raised for the purpose of erecting a club house for the local physicians.

At Chattanooga, free anti-typhoid vaccination is being given.

At Memphis, on February 28, according to a report of the County Health Board, there were 42 cases of smallpox in the county pesthouse and 82 cases had been reported in the county since the first of the year.

*Deaths*

Dr. E. R. Sumpter, aged 58, of Pulaski, died on February 20 in Jacksonville, Fla.

Dr. I. N. Rawls, aged 59, died at his home in Dyersburg on March 2.

## *TEXAS*

At Dallas, the State Medical Association will hold its annual convention on May 8, 9, and 10.

Dr. S. E. Thompson, Kerrville, was recently appointed Superintendent of the Mountain Park Sanitarium.

At Dallas, recently, Dr. C. W. Winckel, Health Officer of Java, West Indies, was studying methods to be used in the sanitation of that island.

At El Paso, Assistant Surgeon C. R. Eskey was on duty recently in connection with the prevention of the introduction of typhus fever into the United States.

*Deaths*

Dr. G. W. Emory, aged 46, Bryan, died in a San Antonio hospital on February 12.

Dr. Dan S. Ashby, aged 50, was killed at his home in Paris on February 23.

Dr. Raleigh R. White died at his home in Temple on March 2d.

Dr. G. T. Parks died at his home in Lancaster on February 24.

## *VIRGINIA*

According to a recent statement of Dr. C. E. Levy, Chief Health Officer of Richmond, he will refuse to accept the responsibility of the health work unless adequate funds are provided for operation of the department.

At Norfolk, "Baby Week" will be held early in May.

At Richmond, a series of lectures on the subject of "Military Hygiene and Surgery" will be conducted at the Medical College of Virginia by Dr. Louis A. LaGarde, Professor of Military Surgery in George Washington University, Washington.

At Abingdon, it was decided, recently, to raise the amount of $50,000 for the purpose of erecting a hospital to the memory of the late Dr. Geo. Ben Johnson.

Dr. E. A. Ratcliffe, Petersburg, and Miss Agnes M. Grigsby, Scribner, were married at Elkton, Md., on January 25.

*Deaths*

Dr. John L. Stearns, aged 82, died at his home in Salem on February 22.

Dr. Oscar Samuel Owens, aged 37, died in Richmond on February 8.

(Continued on page 32)

# Simplicity of Preparation

together with ease of assimilation and the assurance that the food prescribed in stubborn and difficult Infant Feeding cases is clean, wholesome and dependable, have earned for

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"Leaders of Quality
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**Hidden In Dainties**

Here is a bran food which folks will continue. The bran is hidden in luscious flakes of wheat.

No breakfast dainty is better liked than Pettijohn's. Yet it contains 25 per cent of flake bran.

With Pettijohn's Flour, it enables a constant bran diet, varied and appetizing.

This has become the favorite bran food, because it is natural, well-liked and efficient.

You will find it better than clear bran, better than any bran sweet.

You will find it an easy, welcome way to establish the bran habit.

Pettijohn's

***Rolled Wheat with Bran Flakes***

Soft, flavory wheat rolled into luscious flakes, hiding 25 per cent of unground bran. A famous breakfast dainty.

**Pettijohn's Flour** is 75 per cent fine patent flour mixed with 25 per cent tender bran flakes. To be used like Graham flour in any recipe; but better, because the bran is unground.

The Quaker Oats Company
Chicago
(1580)

(Continued from Page 30)

*WEST VIRGINIA*

At Fairmont, Dr. Carroll G. Bull, of the Rockefeller Institute, is investigating the causes of the recent epidemic of anterior poliomyelitis.

At Wheeling, the members of the Ohio County Medical Society have placed themselves on record as opposing the proposed law requiring all the milk sold in towns of over 20,000 population to be Pasteurized.

Dr. Charles H. Clovis, Wheeling, was married on January 11 to Miss Mabel R. Codding, M.D.

*Deaths*

Dr. D. P. Morgan died at his home in Clarksburg on March 10.

Dr. M. F. Bailey, Wheeling, died at his home in Warwood on February 20.


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**ENGRAVED BRASS SIGNS, also Cast Bronze** Tablets for the profession, are progressive, being co d beautiful combined. Its efficiency is the highest type of a sign, to display most distinctively your name and business at your door. Made by Globe Metal Sign Works, 2018 N. Crawford Ave., Chicago, Ill.

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**Genuine Hammock Cart *vs.* The Buggy**

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Costs 1-2 less to buy.
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Lasts 3 times as long-known to run 20 yrs. Safer. Handlier. 1-2 the bother. 1-2 the drag. No weight on horse's back. Easier riding—good roads or bad. No horse motion. Can go where you can't with a buggy. A vehicle for hard service. Pays for itself in saving of horse flesh and horse feed. Pole or shaft. Top or open.
Write for Circular B and Sheets of Testimony.

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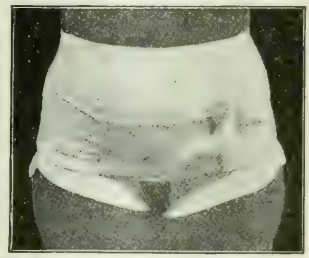

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These are Prof. Anderson's hygienic foods. No other process, we believe, breaks half so many food cells. In many cases you will find them just the foods you want.

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Chicago

(1587)

**Puffed Wheat** **Puffed Rice**
**and Corn Puffs**
**Each 15c Except in Far West**

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**Sterile, Accurate, Efficient In Hypule form**

Sodium Cacodylate, Mercury Biniodide, Mercury Salicylate, Iron Citrate, Iron Citrate and Sodium Arsenate, Emetine Hydrochloride, Fisher's Solution (concentrated), Gray Oil, Novocain and 80 other formulae.

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"The spurious aspirin is a mixture of either calcium phosphate and starch, cream of tartar and citric acid with some alum; or milk sugar, starch and calcium acid phosphate."—(From **N. Y. Health Dept. "Weekly Bulletin,"** Nov. 6, 1915.)

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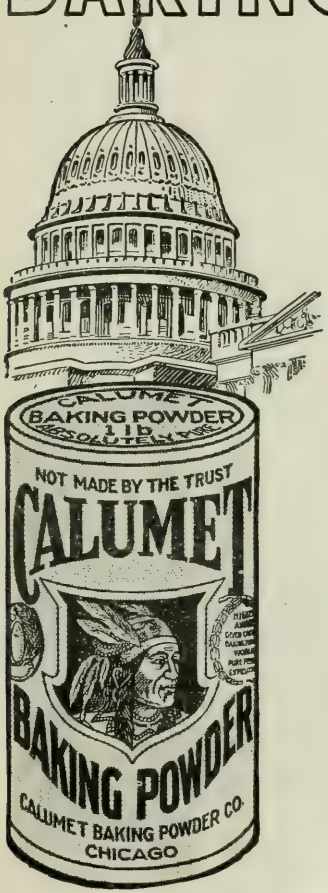


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